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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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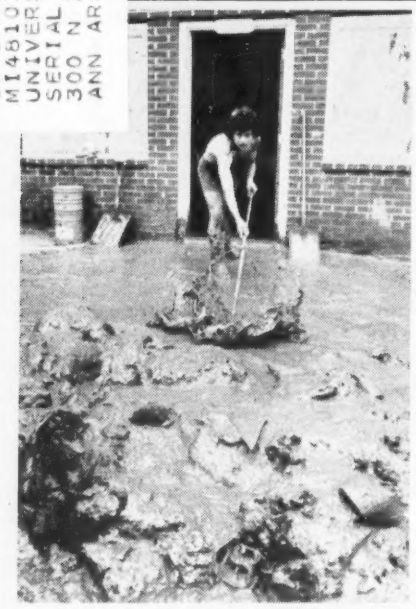

Wide World Photo

DPressing!

Johnstown, Pa., flood victims are just beginning to dig themselves out from under the sludge left by a flood which hit nearly two weeks ago. Most DP installations still don't know the extent of their damage. See story on Page 2.

With Zero-Base Budgeting

Carter May End 'Closet' DP Funds

By Edith Holmes
CW Staff

WASHINGTON, D.C. — President Carter's plan to institute zero-base budgeting throughout the federal government will help end agencies' use of their DP budgets as "closets" in which to hide an extra million dollars or so, representatives of Arthur Young and Co. told a users group meeting here recently.

Zero-base budgeting — or ZBB — will pinpoint actual DP costs early in the budget process through which federal agencies must go, Charles B. Sheridan, a manager with Arthur Young, explained to the Federal ADP Users Group's (Fadpug) special interest group on ZBB and automated DP (ADP).

Like the rest of its agency, a federal DP installation must use this latest budget preparation technique to determine the lowest level of funding at which it can continue to deliver its program and services, Gerald Mendenhall of Arthur Young noted.

Full DP Evaluation

Under ZBB, all DP and other agency activities must be fully evaluated. The process works under the assumption that current operations are not necessarily essential and cost-effective, Mendenhall said.

Agencies must now do what many businesses are already doing: conduct systematic reviews of all their programs and services and rank them according to their importance and value to the organization's overall purpose, he stated.

Agency budget requests must now begin with necessities, move through "wants" and end with "wishes," Mendenhall suggested.

The Arthur Young executives predicted the first year of ZBB will be hardest on federal DP installations, not only because they must use the budget process to make their own funding requests, but they must also help the rest of their agencies understand and employ ZBB.

Sheridan showed 42 attendees at the meeting how one of Arthur Young's commercial clients used ZBB to distinguish between the levels of developmental programming and computer operations that were necessary to the organization's operation and those they had hopes of developing.

For example, in computer operations the organization began by noting that its current funding was $1.762 million. It projected a budget for the next year of $1.706 million, Sheridan said.

For this organization, the bare minimum of computer operation required was to keep its two IBM 370/155s up and running. For an additional $54,000, the DP manager said he would be able to increase the memory capacity on the 155s to a level sufficient to permit the development of interactive capability.

A third level with an additional sum of money would enable the organization to acquire a 370/138 that could be dedicated to interactive programming development.

In addition to employing ZBB to come up with its own budget, a federal DP installation must provide its agency's budget office with simulation capability to perform "what-if analyses" and cost-benefit studies, Sheridan said.

Agency line managers should be able to look to the DP organization for the capability of manipulating and ranking the levels of resources for which they are requesting funds. Ideally, managers should be able to use this DP service in an interactive mode,

(Continued on Page 6)

CRTs Cause of Editors' Cataracts?

By Nancy French
And John P. Hebert
CW Staff

NEW YORK — Two copy editors who work for *The New York Times* were diagnosed as having cataracts after the newspaper switched to electronic editing and typesetting — a change that put the two in front of CRTs all day.

Both editors, who are in their 30s, suspect radiation emitted from the CRTs is to blame.

Cataract victims average 60 years of age, according to Dr. Edward Murphy Jr., a Boston opthalmologist affiliated with the Massachusetts Eye and Ear Infirmary who also teaches at Harvard Medical School.

The disease, which clouds the normally transparent lens of the eye and eventually causes blindness, can be corrected surgically by removing the lens and then adjusting vision with contact lenses and/or thick glasses.

Murphy said the disease is so unusual in people as young as 30 or 35 that when he finds such a case he usually looks for "some systemic disease such as diabetes."

Dr. Milton Zaret of Scarsdale, N.Y., an ophthalmologist and authority on the effects of radiation on the eye, said radiation could be to blame. Zaret was called in on the case after the Newspaper Guild of New York AFL-CIO intervened on behalf of the two copy editors.

At first *The Times* took the position that there was no connection between

(Continued on Page 2)

Mass. Probing Pact Awards With Big Stakes

By Don Leavitt
CW Staff

BOSTON — Several investigations are probing the propriety of two major DP contracts let by the Commonwealth of Massachusetts since the beginning of the year.

The political stakes are enormous.

One of the contracts involves the reorganization and operation of much of the state's DP work, under a five-year facilities management arrangement, for a greatly expanded Department of Administration and Finance (A&F).

(Continued on Page 6)

We've Upgraded, Too

If you think *Computerworld* looks different, that's because it is. We have entered the age of computerized typesetting.

The entire paper has been redesigned to make it easier to read — new typefaces are used throughout, both in the regular body copy and in the headlines. All the sections now have distinctive "banners" to make them more identifiable.

In addition, a new section has been added to the paper. The new section on Microcomputing (See Page 37) will add coverage of the rapidly changing area of microcomputer use in both the hobby and small business areas to our regular sections.

The new type and headlines are made possible through the use of a computer-based composing system and a phototypesetter. The Quadex Corp. Typographer 2 linked to a Dymo Pacesetter replaces IBM MT/STs which we have rented — believe it or not — for 10 years.

The use of computers by a computer publication is nothing startling, but it certainly has given us some additional insight into the problems faced by users every day.

And even though the installation will give us a fund of "horror stories" to trade with users from now on, we hope the new look it gives *Computerworld* will increase your reading pleasure.

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Salvage Attempts Under Way

Johnstown DP Loss Still Unknown

By Ann Dooley
CW Staff

JOHNSTOWN, Pa. — Rescue workers here are struggling to determine the extent of damage to computer equipment and installations in this area, which was hit by a surprise downpour and subsequent flood nearly two weeks ago.

Still hampered by virtually nonexistent communications, mountains of sludge and up to eight feet of water in some areas, service is almost at a standstill.

"We're trying to find out what condition the equipment is in, but some of the [installations] don't even exist anymore," an IBM spokeswoman said.

The flood, the second in the city's history, occurred after 10 inches of rain fell in seven hours, causing the Connemaugh River to overflow.

The day after the flood, an IBM emergency team was set up to try to locate and salvage as much equipment as possible. IBM field managers flew over the area to see what parts of the town sustained the most damage and to determine which customers would need the most help, the spokeswoman said.

The team found three IBM System 32s and one System 3/15B, but all appeared beyond repair, according to the spokeswoman. Two IBM mainframes known to be in Johnstown have not yet been accounted for and, because of the lack of communications, it is impossible to determine the number or condition of those affected in the outlying areas, she said.

Of the four computers that were submerged, all were housed on the first floor or in the basement, the spokeswoman said.

Hampered by Explosion

The rescue workers were making some progress until a gas explosion in a glass factory occurred, causing much of the town to be evacuated, the spokeswoman said.

Crown America, a distribution company here, was one of the few places the IBM rescue team could reach. Crown's System 3/15B was reported unsalvageable, but three data modules on which all customer information was stored have been saved.

The modules, stored in a safe believed to be airtight and waterproof, were soaked by the flood waters but IBM flew them to a center in San Jose, Calif., and 99% of the data was restored, the spokeswoman said.

IBM has leased a warehouse in the area and is sending emergency supplies of floppy disks and other equipment.

Other Vendors' Efforts

NCR Corp. is also organizing an emergency team, but since a written order is needed to enter Johnstown, which is now under martial law, the team has been unable to reach any customers, a spokesman said.

The NCR branch operations facility itself is reported to be under eight feet of water, although no computer equipment is in jeopardy. Many of the NCR installations in the area house their computers on second and third floors and should be out of danger, an NCR spokesman said.

Honeywell Corp. reported that none of its users' installations were affected because most were located on upper floors.

No one could estimate how much damage to computers and equipment has occurred, but the American Insurance Association has said that insured losses could exceed $42.5 million.

Cataracts Caused by CRTs?

(Continued from Page 1)

use of the CRTs and the two cataract diagnoses and that the men probably had cataracts before they began working on the CRTs. But 50 copy editors at *The Times* weren't so sure.

These editors signed a petition asking for an inquiry.

The Newspaper Guild asked the Manhattan Federal District Court to grant a temporary restraining order to take the two editors off the CRTs until new tests could be done.

Judge Thomas P. Griesa ruled the dispute should be settled through arbitration. A panel was selected and at the moment a representative sample of the machines in use at the newspaper is being tested for radiation "by an independent party," according to Harry Fisdell, vice-president of the guild.

Research done to date on the cataract-radiation problem is inconclusive. A study released May 13 by the National Institute of Occupational Safety and Health (Niosh) of Cincinnati stated that CRTs do not emit enough nonionizing radiation to pose an occupational hazard.

The study did acknowledge both copy editors have the type of cataracts "compatible with those reported from exposure to radiant energy."

However, the Niosh report has "fatal flaws," according to Zaret. Further, neither of the two men has "any significant medical history that would lead to the development of cataracts," he said.

Zaret, who has spent 20 years studying the effects of radiation on the eye, said the problems with color TV sets — which also contain cathode ray tubes — have been resolved, but CRT terminals are a "totally unexplored area."

"Deflection coils" which deflect the electronic beam onto the screen "create electromagnetic radiation as well as nonionizing radiation." These could produce cataracts, he said.

The terminals in use at *The Times* are largely Harris Corp. H-1520 CRTs, which create characters using a dot-matrix display, according to Gordon Kilgore, program manager for Harris' Composition Systems Division.

Nearly 1,000 of these terminals are now in use all over the world, Kilgore said, and no problems like this have ever been reported before.

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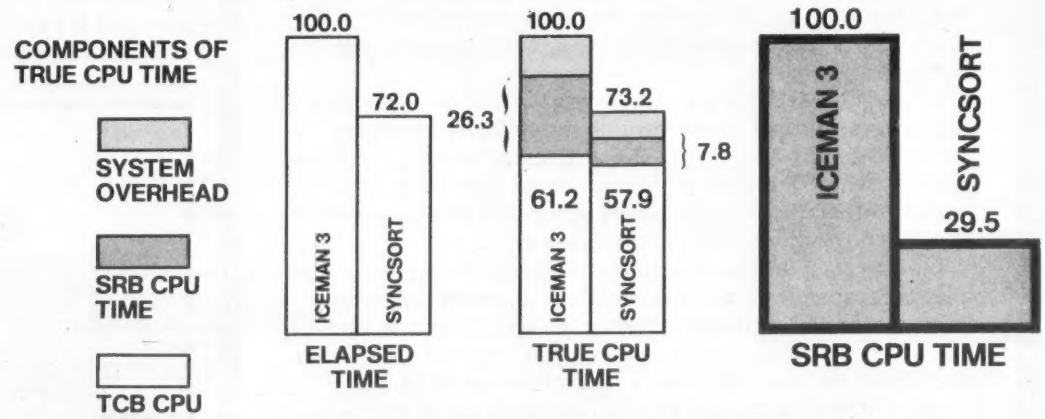
Take the incident that occurred a few weeks ago in a data-processing center that Must Remain Nameless.

In came a very nice, very upstanding IBM representative. His intent was to prove, once and for all, that IBM's new SM1-5740, Release 3, was superior to Whitlow's Sync-Sort III-and-a-half.

As the sun sank slowly in the west, the IBMer rolled up his sleeves and set to work. Benchmark followed benchmark. Hours passed. Results began to emerge. Inevitably, they looked like this:



By the time the poor fellow departed the premises, looking a bit crestfallen, even he was admitting that SyncSort was probably the data-processor's best bet.

It was one of the nicest recommendations we ever received!

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Report Indicates Congress Erred

GAO Urges Study of Alternatives to 'Target'

By Edith Holmes
CW Staff

WASHINGTON, D.C. — The final version of a General Accounting Office (GAO) report on the Veterans Administration's (VA) proposed Target system suggests Congress erred in its recent decision to fund the controversial computerized claims-processing system for 1978.

After the House and Senate couldn't agree on the project, a conference committee meeting earmarked $18.4 million for the system for fiscal year 1978, even though committee members had in their hands the draft of the GAO report, which called the system "still a risky venture [CW, July 25].

"The costs and benefits of the proposed system and alternatives to it were not thoroughly evaluated. They should be," according to the final, "restricted" GAO report dated July 29, which was obtained here last week by *Computerworld*.

The GAO recommended Congress not permit the VA to award a contract for the $100.9 million system, which would cost an additional $12.5 million to operate each year, until the VA has set up measurable goals and standards for improving benefit claims services to veterans.

"Proponents of the Target system argue that the present benefit claims system is inefficient and that service to veterans is suffering," the GAO report noted. "Yet, VA had not established measurable goals or standards for improved service.

"In other words, VA had no basis for comparing alternative approaches and for determining whether systems less complex and less expensive than Target could do the job," the GAO concluded.

In fact, the administration proceeded with the development of Target without any economic analyses of alternative ways of meeting its benefit claims-processing needs, the report said.

Cost-Benefit Analyses

Major cost savings are possible with Target, but equally realistic are cost projections which exceed the system's monetary benefits when compared with the VA's current benefit claims-processing methods, the GAO study stated. The venture is thus "risky," Congress was told.

Even if the VA developed the necessary goals and standards for improved benefit service to veterans, as the GAO recommended, Congress should continue to hold up any contract award for Target until the VA produces a "definitive and complete" implementation plan for the system, the GAO said. That plan should resolve current uncertainties about the progress of development on Target, the costs involved and the implementation schedule for the system, the report added.

Cleland's Comments

The 75-page GAO report included comments by VA administrator Max Cleland, who agreed that measurable goals and standards for improving service to veterans are needed, but believes "the outstanding questions [concerning Target] have been satisfactorily resolved" and "the VA should proceed immediately with the necessary steps to make the Target system a reality at the earliest possible date."

Cleland stated that since he became VA administrator on March 2, he has given "top priority" to a thorough study and analysis of Target by himself and key VA officials.

He pledged the VA "will identify goals, objectives and performance standards for the Target system which will be quantified before installation, against which the system benefit improvements will be evaluated."

The GAO stated its belief that such measurements will need to be made in order to assess Target's success if it is implemented, but added this is not the action it had recommended. What GAO suggested was that the VA "establish, in measurable terms, goals and standards for improving benefit claims services to veterans *before* it can adequately determine what type of system it needs to meet those goals and standards at the least cost," the GAO report explained.

Cleland further contended that the revised system implementation schedule presented to the GAO and to Congress can be achieved with "very low risk of disrupted service to the veteran population" and that VA's analysis of the schedule "demonstrates conclusively that Target will be cost-beneficial."

The GAO, however, does not agree with Cleland's assertion that the revised schedule and related cost-benefit analysis resolve any of the uncertainties cited in its report about the progress of VA's development, its costs or its implementation.

The GAO inquiry into the cost-benefit justification of Target was originally requested by Representatives John E. Moss (D-Calif.) and Charles Rose (D-N.C.) in December 1975.

DPMA Fighting Software Tax

CHICAGO — The Data Processing Management Association (DPMA) has joined the battle against taxation of software and services now being waged in half a dozen states by pledging $1,400 to fund efforts in New York and Tennessee.

The results of those efforts will determine future action in other states where software and/or services are taxed, such as California and Wisconsin, according to George Eggert, head of the DPMA's Industry and Government Relations Committee.

The DPMA has retained Robert M. Sherin, president of Nova Computing Services, Inc. of Miami, to argue its case in an open hearing with New York State Tax Commissioner Thomas H. Lynch on Aug. 23.

The organization seeks to exempt software, services and telecommunications from taxation.

Seeking Funds

Eggert plans to issue a broad appeal for funds to finance the fight against software taxation; his proposal is currently under review of DPMA's legal staff, he indicated.

If the DPMA's involvement reaches the point of judicial action, Eggert said it must go back to the drawing board because Sherin is not an attorney. Hopefully there will be money in the fund to finance such action, he added.

Eggert called the DPMA the logical vehicle to wage the fight against software taxation, but admitted the group lost some momentum because it has "dragged its feet" since it first expressed interest in the issue [CW, May 16]. However, Eggert expects the movement will pick up.

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UPC-Based Store Ordered to Price-Mark Items

By Ronald A. Frank
CW Staff

SALEM, Mass. — An automated supermarket checkout system has become the subject of a legal suit between the Massachusetts Attorney General's Consumer Protection Division and Purity Supreme, Inc. here.

The IBM 3660 supermarket system was installed by Purity Supreme in its Heartland warehouse store as part of a full scanning checkout system using the Universal Product Code (UPC).

The UPC is used with scanners at checkout terminals so bar-coded labels on grocery items automatically trigger a price lookup operation in a store's processor. When identifying data about an item is transmitted to a price data base in the computer, the price is displayed at the checkout terminal and printed on the customer's receipt tape.

In keeping with its warehouse image, the low-cost supermarket uses price marking only on shelves, not on individual items. The store gives customers grease pencils to mark items purchased if they feel prices are needed.

However, the consumer office of the Massachusetts Attorney General's office stepped in to require that Purity Supreme mark the price on each item in compliance with a state regulation that requires each item of food in a store to have a price on it.

Purity Supreme then filed a countermotion seeking to bar the state from enforcing the regulation. After hearing arguments by both sides in Middlesex Superior Court, Judge Alan Dimond last week issued a preliminary injunction against the supermarket chain, requiring that all items be price marked.

The Salem Heartland store has 12 automated checkout terminals; it stocks 2,500 items according to Timothy Goodburn, computer operations manager at Purity Supreme. The IBM 3660 has been operational since March.

Commenting on the possible abuses of such a system, Assistant Attorney General Paula Gold said "the real danger is that it is so much easier to change prices with a computerized checkout system. It is also easier just to increase prices because you don't have to reprice the item on the shelf."

According to figures from the supermarket chain, the annual cost to a customer to price each item is about $7 per year, and this is the minimal amount that the user will pay for having the prices, Gold said.

As soon as Judge Dimond issued his order in the case, the Consumer Protection Division planned to send someone to the Heartland store "to make sure they have actually put the prices on," she said. "I have every reason to believe that they will comply."

The next step in the legal proceeding is up to the company, according to Gold, and it has two options — to appeal the judge's ruling or to ask a trial on the merits of the case.

Purity Supreme officials said any comment would have to come from Leo Kahn, president, but Kahn could not be reached.

Most Customers Happy

Rudolph Kass, attorney for Purity Supreme, said the order to price mark items "is only a preliminary round. Of course we are disappointed and of course we will comply with the order of the court pending further proceedings."

Dimond's decision "was not a decision on the merits of the case" and Purity Supreme intends to pursue the issue on two fronts. First, it will proceed with the litigation; secondly, it will proceed with "administrative steps" to try to get changes in the state regulation, Kass said.

The company conducted a survey at the Salem store, he noted, and 96% of the customers "are pleased wth the system." Four percent said they would like to have items marketd.

Gold said she was not sure whether the initial complaint about a lack of prices at the Heartland store had come from a disgruntled shopper. But the Consumer Protection Division will enforce the state pricing regulation whenever a store is found eliminating item price marking, she said.

Kreps Defends Carter OTP Plan

WASHINGTON, D.C. — Secretary of Commerce Juanita Kreps has defended President Carter's move to reorganize the Office of Telecommunication Policy (OTP) and welcomed the opportunity to get into the national debate over communications policy.

"The reorganization plan calls for the appointment of an Assistant Secretary for Communications and Information, providing a clear indication of the significance that President Carter and I attach to communications issues," Kreps said in a recent statement here.

Many members of Congress criticized Carter's plan because they felt such a move will downgrade the OTP's visibililty [CW, July 25].

Under the President's plan, the Commerce Department will assume many of the functions previously performed by the OTP, Kreps said.

"We will be dealing with more than mere technical specifications and system configurations, we'll be addressing issues that will affect the ways people communicate and the matter in which the technology of communications is controlled," she stated.

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New Trial for Catamore

WASHINGTON, D.C. — Phase one of IBM vs. Catamore Enterprises, Inc. has ended with the case awaiting its second trial in Rhode Island after the U.S. Supreme Court refused to hear Catamore's appeal of a lower appeals court decision.

But nobody knows when the trial is likely to start because the Rhode Island court is functioning with only one judge whose time is consumed with criminal cases, sources said.

The First Circuit Court of Appeals in Boston last September overturned a jury decision awarding Catamore $11.4 million and ordered the case returned for a new trial [CW, Oct. 4].

Catamore fought this order through the appeals process all the way to the Supreme Court.

The case involved an unhappy user which contracted for a system prior to unbundling and which allegedly did not receive the software IBM had agreed to supply.

ZBB May End Closet Funds

(Continued from Page 1)

Sheridan noted.

Finally, the accounting department must be able to keep track of funds budgeted vs. those monies actually spent. Again, the DP operation can be expected to help, he said.

Many simulation packages are available commercially, and the Civil Service Commission has developed a prototype simulation package designed specifically for ZBB, Sheridan told his audience. He urged attendees to use mathematical models if they decide to develop their own simulation systems because these models can take into account changes in the economy and in legislation.

An agency's ZBB DP system should be driven by an accounting-budget base, Sheridan said. This base should contain a chart of accounts, an organization index, historical expenditure and budget records and current fiscal year accounting and budget data.

This accounting-budget base in turn will run a budget formulation process and a budget execution process.

Under the budget formulation process, the system will contain the simulation model, interactive programs for management inquiries, software that ranks services according to end product and programs for historical trend and possibly regression analysis.

The budget execution process will involve an appropriation accounting system, reporting on budgeted funds vs. monies actually spent, funding projections, costs to complete budget analysis, planning tools and answers to such management questions as "How am I doing?" and "How much money do I left?"

In persuading an agency's managers to use DP assistance in the ZBB process, DP installations need to keep the system simple.

They also need to use a minimum of codes and abbreviations. Where the system permits managers to interact with it, always provide prompting and don't let the system distract them from the budget process, Sheridan advised.

The special interest group on ZBB and ADP plans to hold further meetings, including a conference on this budgeting technique late this fall or early next spring, according to chairman Kendall E. Burroughs.

Open to organizations outside the government, the group was formed "to gather, develop and exchange information and guidelines for supporting ZBB with computer resources and applying ZBB techniques to ADP budgeting, Burroughs said.

Anyone interested in participating in this group can contact Burroughs at the U.S. Chamber of Commerce, 1615 H Street N.W., Washington, D.C. 20062.

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Mass. Probing Big Awards; Conflict of Interest Charged

(Continued from Page 1)

When and if that contract goes into effect, it will be the most sweeping facilities management agreement let by any state, according to several observers.

The other pact covers the development of programs and the use of those programs to process Medicaid claims for the state.

The state Attorney General's Office is conducting one of the investigations at the request of A&F Secretary John R. Buckley. It was the selection process followed by Buckley's office, which made both awards, that gave each of them at least the appearance of a conflict of interest in violation of state law.

Both awards ultimately involved Electronic Data Systems, Inc. (EDS), even though the Dallas-based firm's bids were apparently not the lowest received in either case. Various other alleged irregularities further cloud the Medicaid award, which went to Blue Cross-Blue Shield of Massachusetts, with the processing subcontracted to EDS.

Other bidders on one or both of the contracts included Arthur D. Little, Inc. of Cambridge, Mass.; Booz, Alan & Hamilton of Washington, D.C.; and Computer Sciences Corp. of El Segundo, Calif.

The Governor's Advisory Committee on Computers and Data Processing is conducting its own probe of both situations. And the Massachusetts Legislature, which must appropriate funds before either contract can go into effect, is also becoming concerned about how the awards were made.

Overall, the probes are attempting to determine how real the alleged conflict of interest is, what can be done about it and how a repetition of the current confusion can be avoided in the future.

Contract Delays Blamed

The question of conflict of interest revolves around an almost unknown consulting firm, Sci-Tek Associates of Boston. Two members of the firm are members of Buckley's selection committee and voted to award the facilities management contract to EDS at the same time Sci-Tek was working with EDS on another business venture.

According to news reports, Robert Orr, one of the Sci-Tek men on the selection committee, left a meeting of that group — after voting for EDS — to fly to Memphis, Tenn., where he met with EDS officials to plan a combined proposal they were to present to that city.

Sci-Tek had sought the Memphis work on its own, but was told its proposal would be considered more favorably if it also involved another firm — EDS, for instance — with a more substantial reputation, the news reports said.

Defending his company's actions, Sci-Tek co-owner James Corkery contended it was delays in the Massachusetts contract selection process that created the appearance of the conflict of interest.

The process here was supposed to be finished in January, he said, while the Memphis contract didn't come up for consideration until early February.

The Massachusetts pacts involve high monetary as well as political stakes. The A&F facilities management agreement is worth $23.5 million; the Medicaid contract carries a $19.5 million price tag.

But the Medicaid contract has even higher potential benefits for Blue Cross-Blue Shield, according to one informed source. That insurance group hopes to become the "fiduciary intermediary" — the dispenser of funds — as well as the processor of claims for the system.

If that happens, "the Blues" could gain control of a half-billion dollar operation, he noted.

But that may be a way off, for there are still several issues to be resolved in addition to the possible conflict of interest. One of the losing bidders claimed, for example, that Blue Cross-Blue Shield had an exclusive opportunity to conduct an extensive study of the Medicaid system shortly before the state decided to put the work out for bid.

Specifically, Blue-Cross-Blue Sheild ran a study for the state in 1975. This resulted in the preparation of "eight or nine volumes, covering about three feet of shelf space," according to a person who was involved with the project.

Since this work was done under contract, the state considers these volumes to be proprietary and though "the Blues" have copies, none of the competing firms can see them, he added.

Language Difference

Another complaint lodged against the awarding of the Medicaid contract to Blue Cross-Blue Shield and EDS revolves around the bidder's intention to do the programming in BAL despite the request for proposal's call for the use of Cobol.

Cobol was specified because Medicaid is a federal program and both transportability and modification of programs nationwide would be simpler with a language that is common to various computers.

On the other hand, a former official of the state's Medicaid claims program argued that since Blue Cross-Blue Shield does "most of its work" in BAL, "it would be more convenient" for the company to do this work in that language, too.

George Schussel, a member of the Governor's Advisory Committee on Computers and Data Processing, argued that the language difference "would be significant in such a proposal. Perhaps not an overwhelming issue, but certainly an important point. It is not inconsequential."

'Waves' Not Ebbing

Waves of Change by Charles P. Lecht, which has been appearing in *Computerworld* in recent weeks, will be discontinued for the remainder of the summer.

The next chapter, which concerns minicomputers and microcomputers, will appear when the series resumes in September.

At Toronto Conference

Ifip President to Speak on DP Mart, Profession

TORONTO — Dr. Richard I. Tanaka, president of the International Federation for Information Processing (Ifip), will give a major address here as part of the organization's first North American conference since 1965.

In his presidential address, Tanaka will assess the present worldwide status of the information processing community with attention to professional issues as well as the burgeoning marketplace for computer products and services.

The address will be presented on Monday, Aug. 8, immediately following the opening keynote.

Dr. John E. Fobes, deputy director-general of the United Nations Educational, Scientific and Cultural Organization (Unesco) in Paris, will also participate in the president's session and express his views and perspectives on the international impact of computing.

According to Tanaka, Fobes' remarks should be particularly pertinent because Ifip's relationship with Unesco marked the first official ties established between Ifip and other international organizations.

Issues Complex

"The issues facing the international computing community are complex and we can expect them to become even more critical in the years ahead as the proliferation of computers and data communications networks becomes even more pervasive," Tanaka said.

"These issues touch upon many areas including computer science, technology, the expanding activities of multinational corporations and the emergence of international networks. The issues relate to national interests in both the developed and developing countries, as well as the need in many areas for a relatively 'open marketplace' in order to foster the continuing development of our technology and its application," he continued.

"The worldwide growth of the computing field shows little sign of tapering off to any significant extent. For example, the world revenues of U.S. computer manufacturing and service firms is estimated to have been $26.6 billion in 1976 and may well reach $51 billion by 1981. Present estimates show that U.S. computer manufacturers account for approximately 87% of the world's computers by value," he said.

Any company whose products are commercially sound enough to compete in the demanding U.S. marketplace should probably be doing at least half of its total business outside of the U.S. Where this is not the case, the company's management might be neglecting its opportunities, he added.

Tanaka has served as Ifip president for three years and is presently a consultant in the area of international marketing and management. He is a past president of the American Federation of Information Processing Societies, Inc. (Afips) and served for many years as a senior executive of California Computer Products, Inc.

Ifip Congress 77 wil be held here Aug. 8-12, and more than 10,000 people are expected to attend program sessions and special events, plus a major exhibit of computer hardware, software, systems and services.

The exhibits will be held on the exposition floor of the Sheraton Center.

Dr. Richard I. Tanaka

Ifip Announces Student Rates At Toronto Meet

TORONTO — The organizing committee for the International Federation for Information Processing's (Ifip) Congress 77 has announced a special $30 registration fee for students who wish to attend the international congress here Aug. 8-12.

The fee covers admission to all technical sessions and Exibition 77.

Full-time students with valid identification may register on-site.

Housing accommodations can be made by contacting Marion Hart, Canadian Information Processing Society, Suite 501, 212 King St. W., Toronto, Ont. M5H 1K5, Canada Telephone: 416-366-4586. For those students who are interested, the University of Toronto is offering single rooms at the rate of $12 per day.

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To date, I have received dozens of letters from people who have bought our books. Letters of praise and letters of encouragement. Some excerpts:

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"Your books have saved me around $1200 as I was going to send one of my programmers to IBM school in Los Angeles, but thanks to your manuals he now has a working knowledge of BAL and won't need to go."

"As I read through your book, and I began formulating questions in my mind, I found that every question was answered shortly afterwards. I have never felt so comfortable with a subject that has always made me a little uneasy."

"I have found your book to be invaluable not only as instructional material, but as a reference work as well."

"The most useful facet of the book is the modular approach. I was not able to devote eight hours a day to learning the language, and your highly organized approach allowed me to spend any time I had available."

What the books do

The first five chapters of these books present a professional subset of assembler language including core dump analysis and debugging. In my opinion, these chapters could be subtitled: "The Least an Applications Programmer Should Know About Assembler Language." If you do nothing more than master this material, I think you will justify the cost of the book several times over.

The next ten chapters present advanced assembler language subjects: binary arithmetic, table handling, editing, bit manipulation, translation, subprogram linkage, writing macro definitions, and using sequential, indexed, and direct files. One COBOL programmer told me she never really understood subprogram linkage before she read our book. And a systems programmer says our chapter on writing macro definitions can save hours of research.

The last chapter presents the operating system and its job-control language. It shows you how to code JCL for assembly and test runs, for using macro libraries, for linking object modules, and for using some basic utilities. For the novice, this chapter is invaluable.

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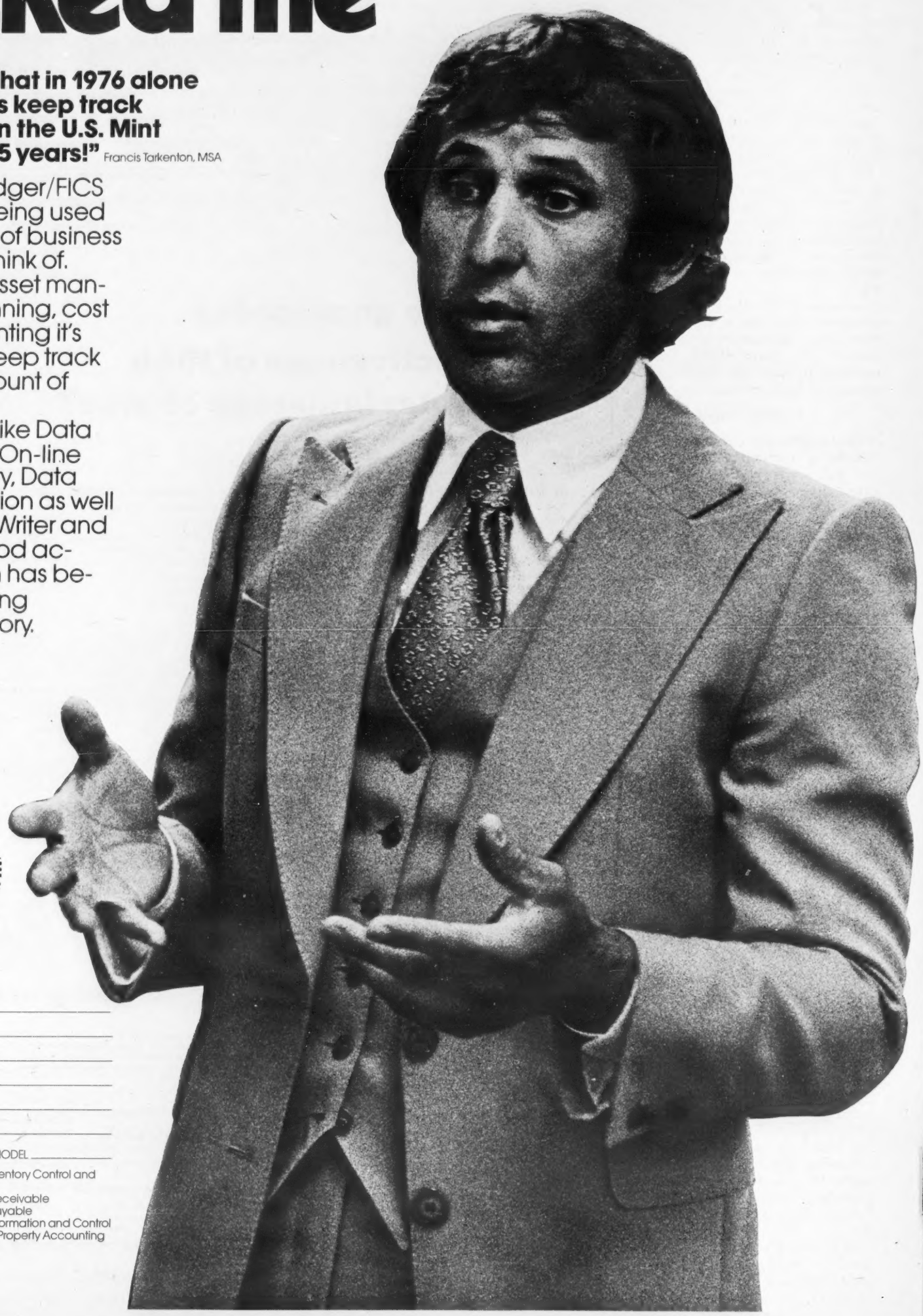

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Early DP Artists Tacked on Title Last

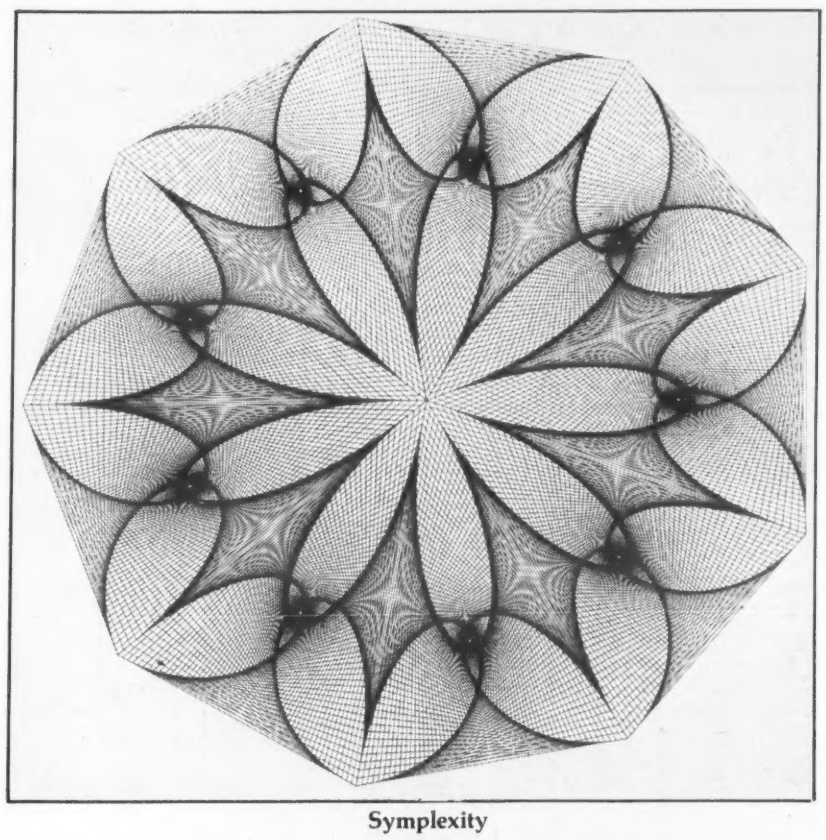
By Nancy French
CW Staff

ANAHEIM, Calif. — Although computer-generated art probably dates back to the late 1950s, interest in the computer as an artist's tool got a big boost from a contest sponsored by California Computer Products, Inc. in 1968.

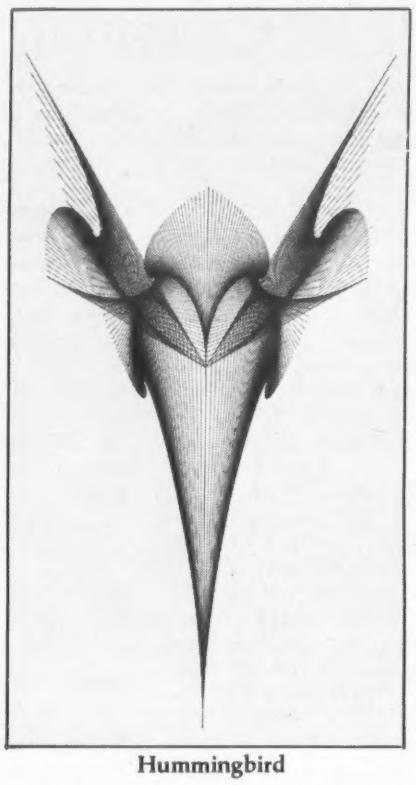
In that contest, users of Calcomp printer/plotters were invited to compete for a total of $10,000 in scholarships and $1,000 in cash. The contest attracted thousands of entries.

The contest was largely a promotional gimick to demonstrate the capabilities of the company's plotters.

The relatively primitive works shown here, like most of the art from this period, was based on simple Fortran programs, according to a Calcomp programmer.



Symplexity



Hummingbird

The artist usually started with a couple of trigometric or exponential functions, he said. These were plotted "to see where the ends of the lines went," and those were then connected with straight lines. More and more lines and angles were added until the design was completed.

These creations, such as the "Hummingbird," "Snail" and "Symplexity" shown here, for example, were named after they were created, based on what the design looked like.

These pieces of art were created by Kerry Strand, who was a Calcomp employee at the time.

The plotter actually played more of a role than merely that of a pen point, the programmer indicated, and that was because, by today's standards, the plotters were relatively slow and not all that precise. The lines they printed had a wavy quality, a Calcomp spokeswoman added.

The "moires," or shimmering patterns within the overall design, were created by superimposing two geometric patterns at acute angles.

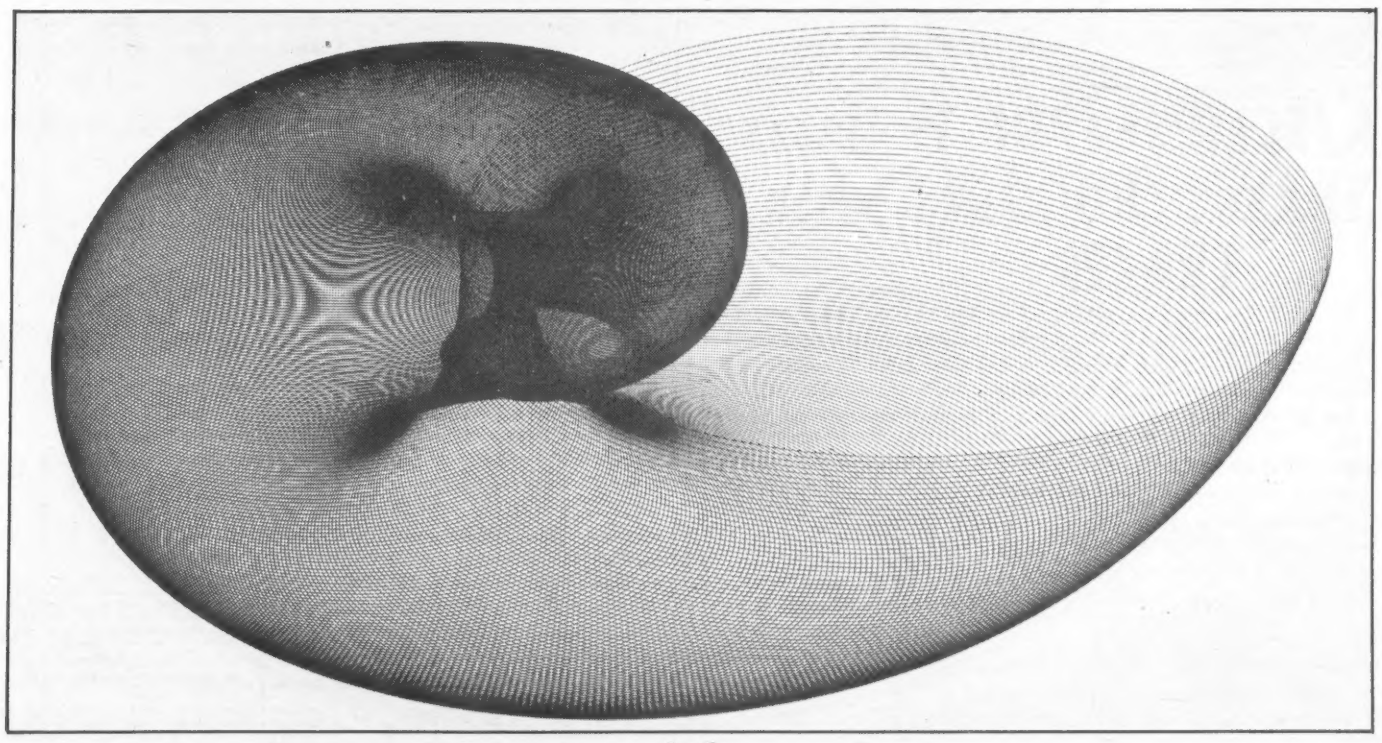
Moires are less common in today's computer art because of the advances in the plotting tools now available, the Calcomp programmer said.

There was no on-line programming in those days either. At Calcomp, the Fortran programs were keypunched and then run through the firm's General Electric 400 computer, where they were compiled and executed.

The results were then output onto magnetic tape and the designs were printed in off-line mode on a Calcomp 702 flatbed printer/plotter, he said.

The three works shown were created generally the same way. Hummingbird was entered in the sixth annual *Computers and Automation* Computer Art Contest in 1968, where it won the top prize, the Calcomp spokeswoman said.

New Masters



Snail

Calendar

Sept. 6-9, Washington, D.C. — **Compcon 77**, sponsored by the IEEE Computer Society. Contact: IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

Sept. 7-9, Rocquencourt, France — **Data Processing and the Analysis of Data**, sponsored by the Institute of Research in Data Processing and Automation. Contact: Institut de Recherche d'Informatique et d'Automatique, Service des Relations Exterieures, Domaine de Voluceau — Rocquencourt, 78150 Le Chesnay, France.

Sept. 7-9, Boston — **Sixth Annual Conference of the Mumps Users Group**. Contact: Richard E. Zapolin, Program Chairman, Mitre Corp., P.O. Box 208, Bedford, Mass. 01730.

Sept. 9, New York — **Data Processing Librarian (DPL) and Documentation Managers Association (DMA) Meeting**. Contact: DPL/DMA, P.O. Box 572, Bowling Green Station, New York, N.Y. 10004.

Sept. 12-14, Chicago — **Seventh National Seminar: Total Corporate Approach to Data Processing Security**. Contact: Jon Allen, Data Processing Security, Inc., 235 Northeast Loop 820, Hurst, Texas 76053.

Sept. 14-15, El Paso, Texas — **Minicomputer Show and Exposition**, sponsored by the El Paso Chapter of the Data Processing Management Association (DPMA). Contact: El Paso Chapter, DPMA, P.O. Box 1894, El Paso, Texas 79950.

Sept. 15-16, Edmonton, Alta. — **Northwest Systems Conference of the Association for Systems Management (ASM).** Contact: I. Stuparek, 10040 104 St., Edmonton, Alta. T5J2V6, Canada.

Houston Personal Computing Faire. Contact: Richard McClendon, P.O. Box 36584, Houston, Texas 77036.

Sept. 19-21, San Francisco — **Western Electronics Show and Convention (Wescon/77)**. Contact: William C. Weber Jr., General Manager, Wescon 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.

Sept. 22-23, St. Louis — **Datacon '77: Spirit of St. Louis**, sponsored by the St. Louis Chapters of the Association for Systems Management (ASM) and the Data Processing Management Association (DPMA). Contact: John Vaughan, ASM/DPMA, P.O. Box 1401, St. Louis, Mo. 63188.

Sept. 24-27, New York — **Automated Communications 1977**. Contact: John Avers, Automated Communications 1977, Suite 814, 342 Madison Ave., Suite 814, New York, N.Y. 10017.

Sept. 26-28, Arlington, Va. — **Eascon 77,** sponsored by the Institute of Electrical and Electronics Engineers and the Aerospace and Electronic Systems Society. Contact: Wayne Shufelt, Eascon '77 Publicity Chairman, Sperry Univac, 2121 Wisconsin Ave. N.W., Washington, D.C. 20007.

Sept. 26-28, San Francisco — **Government Project Management**, sponsored by New York University. Contact: Government Project Management, New York Conference Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Sept. 26-29, Chicago — **Information Management in the Eighties**, sponsored by the American Society for Information Science (Asis). Contact: Asis, Suite 210, 1155 Sixteenth St. N.W., Washington, D.C. 20036.

Sept. 26-30, Washington, D.C. — **How to Conduct a Performance Audit of Your Computer System**, sponsored by Keston-Barnett Associates, Contact: Dr. Robert Keston or Arnold Barnett, Kestonarnett Associates, Suite 603, 1010 Rockville Pike, Rockville, Md. 20852.

Sept. 26-28, Los Angeles — **MIS Productivity**, sponsored by the Society for Management Information Systems (SMIS). Contact: SMIS, 10 W. 31st St., Chicago, Ill. 60616.

Sept. 28-30, San Francisco — **Microcomputers: The Application Explosion**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Chris Spark, AIIE, Computer and Information Systems Division, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 28-30, Gaithersburg, Md. — **Data Elements Management Symposium.** Contact: Hazel McEwen, Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C. 20234.

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States With Laws on

By Toni Wiseman
CW Staff

Several states joined the electronic funds transfer (EFT) bandwagon during 1977 and enacted laws to set to rest — at least temporarily — the questions often raised about branching, sharing and various EFT functions.

Spurred perhaps by the sporadic reports and recommendations issued by the National Commission on EFT, the states of Arkansas, Colorado, Idaho, Maryland, Montana, New Mexico, North Carolina, South Dakota, Tennessee and Utah were among those that either approved legislation for the first time or broadened or redefined existing laws.

Thirty-two states currently have laws affecting EFT. Of these, some (such as Kansas) have different laws for banks than for savings and loan (S&L) associations. In toto, 12 laws permit limited branching,

STATE	Applies To	Branching Law	Out Of State Entry	Is Facility A Branch	UNMANNED REMOTE FACILITY							
					Geographical Area	Functions: Deposits	Functions: W D	Functions: Pre-auth Loans	Functions: A C Transfers	Sharing: Like Institutions	Sharing: Unlike Institutions	Advance Supervisory Approval
COMPTROLLER OF THE CURRENCY (Revised Ruling May 9 1975 Rescinded August 23 1976)[1]	National Banks	N/A	N/A	No	Within 50 miles of main or branch office[2]	Yes	Yes	Yes	Yes	P[3]	P[3]	Notice only
ALABAMA Act 1127, Laws of 1975	Banks S&Ls CUs	L	Yes, Reciprocal only	Silent	Silent	The Superintendent of Banking may authorize activities properly incident to the business of banking through on-premise as well as off-premise operations. Savings and loan associations and credit unions may not offer services now prohibited to them. NO distinction is made between manned and unmanned remote facilities.						
ARKANSAS Act 643, Laws of 1977	Banks	L	No	Silent	Limited	Yes	Yes	Yes	Yes	P	S	Notice only
COLORADO S.B. 468, Laws of 1977	Banks S&Ls CUs Industrial Banks	U	No	No	Statewide	Yes	Yes	Yes	Yes	M	P	Notice only
CONNECTICUT Public Act 75-373	Banks SBs S&Ls	S	No	No	Statewide[4]	Yes	Yes	Yes	Yes	M	M	Yes
FLORIDA Chapter 75-134	Banks S&Ls CUs	L	No	No	Statewide	Silent	Yes	Silent	Silent	P	P	Notice only
GEORGIA Act 169, Laws of 1975	Banks	L	No	No	Limited	← routine banking transactions →				P	P	Yes
IDAHO Chapter 248, Laws of 1976	Banks	S	Silent	No	Statewide	Yes	Yes	Yes	Yes	M[5]	M[5]	Notice only
S.B. 1022, Laws of 1977	CUs	S	Silent	No	Statewide	Yes	Yes	Yes	Yes	M[5]	M[5]	Notice only
ILLINOIS Public Act 79-1387 Laws of 1976	N/A	U	N/A	N/A	Creates an Electronic Funds Transfer System Study Commission "to conduct a thorough study of electronic funds transfer systems and their possible use within the state and to consider the public policy and other considerations including the consistency of EFTS with presently existing statutes." Commission shall report its findings and suggestions to the 79th General Assembly by December 31, 1976.							
IOWA H.B. 1478 Laws of 1976	Banks S&Ls CUs	L	No	No	Statewide	Transactions which are incidental to the conduct of the business of the financial institution."				M	P	Yes
KANSAS S.B. 515 Laws of 1975	Banks	U	No	No	Statewide	← Banking transactions →				M	S	No
S.B. 519 Laws of 1975	S&Ls	S	No	No	Statewide	Yes	Yes	Yes	Silent	M	S	No
LOUISIANA Act 241, Laws of 1975	Banks	S	Silent	Silent	Adds incidental power clause allowing commissioner to authorize "consistent with services offered by banks chartered under the laws of the United States."							
MAINE Chapter 500, Laws of 1975	Trust Cos SBs S&Ls	S	No	Yes	Statewide	Yes	Yes	Yes	Yes	M	M	Yes
MARYLAND Chapter 515, Laws of 1975	Banks SBs	S	No	No	Statewide (locations remote from main office or branch)	Yes	Yes	Yes	Yes	P[6]	P[6]	Yes
Chapter 412, Laws of 1977	S&Ls	S	Silent	No	Statewide	Yes	Yes	Silent	Silent	P[7]	P[7]	Yes
Chapter 540, Laws of 1977	N/A	S	N/A	N/A	Creates an advisory panel to study and evaluate the benefits and drawbacks of EFTS and to make recommendations to the General Assembly. Interim report is due December 1, 1977. Final report is due December 1, 1978.							
MASSACHUSETTS Chapter 1147, Laws of 1973 and Chapter 32, Laws of 1977	Banks SBs S&Ls CUs	L	No	Silent	Limited	Silent	Yes	Silent	Silent	P	P	Yes
MONTANA Chapter 503, Laws of 1977	Banks S&Ls CUs	U	No[8]	No	Limited	Transacting any business in a financial institution.				M[5]	M[5]	Yes
NEBRASKA L.B. 269 Laws of 1975	Banks	U	No	No	Silent	Yes	Yes	Yes	Yes	M	S	Yes
NEW HAMPSHIRE Chapter 233, Laws of 1975 (Wild Card)	Banks SBs S&Ls	L	Silent	Silent	The Board of Bank Incorporation may promulgate rules permitting any bank or cooperative bank to establish and maintain electronic devices or machines similar to those permitted by the Comptroller of the Currency for national banks, or by the Federal Home Loan Bank Board for federal savings and loan associations.							
NEW JERSEY Chapter 148, Laws of 1975	Banks SBs	S	No	Yes	Statewide	Any business conducted at principal office				P[10]	P[10]	Yes
Chapter 159, Laws of 1975	S&Ls	S	Silent	Yes	Permits establishment with the Commissioner's approval of "limited facility branch offices" which may be fully automated. Commissioner must adopt regulatory requirements "in substantial conformity" with those of the FHLBB.							

EFT Now Number 32

21 allow statewide branching and seven sanction unit branching.

Only five states — Maine, Oregon, New Jersey, New Mexico and New York — define remote facilities as branches. Ten states, however, have remained silent on the issue.

Sixteen states have mandatory sharing provisions for like institutions, while only seven mandate sharing among unlike institutions.

Along with the new legislation, industry observers are witnessing a flood of new lawsuits challenging these laws.

STATE	Applies To	Branching Law	Out Of State Entry	Is Facility A Branch	UNMANNED REMOTE FACILITY							
					Geographical Area	Functions: Deposits	Functions: W/D	Functions: Pre-auth Loans	Functions: A/C Transfers	Sharing: Like Institutions	Sharing: Unlike Institutions	Advance Supervisory Approval
NEW MEXICO Chapter 359, Laws of 1977	Banks S&Ls CUs	L	No	Unmanned Yes Manned No	Limited	Yes	Yes	Yes	Yes	P	P	Yes
NEW YORK Chapter 764, Laws of 1975	Banks SBs S&Ls	S	Silent	Yes	Permits establishment of ATMs and POS terminals pursuant to regulations of the banking board. Such devices engaged in "deposit-withdrawal activities" are branches. Numerical restrictions on new branches for savings banks and S&Ls do not apply.							
NORTH CAROLINA Chapter 553, Laws of 1975	Banks	S	No	No	Subject to the rules and regulations of the State Banking Commission, banks may establish manned or unmanned off-premise facilities.							
Chapter 473, Laws of 1977	S&Ls	L	Silent	No	Statewide	Any financial service or transaction rendered to the public				P	P	Yes
NORTH DAKOTA H.B. 1542, Laws of 1975	Bank of N.D.	U	N.A.	No	The N.D. State Bank may establish EFT system for its customers and customers of other financial institutions authorized to utilize such services (includes State banks)					M	M	Yes
S.B. 2443 Laws of 1975 (Wild Card)	Banks		Silent	No	Silent	Yes	Yes	Yes	Yes	M	S	Yes
OKLAHOMA S.B. 590, Laws of 1976	Banks	U	No	No	Silent	Any transaction contracted for at main office				M	P	Notice only
OREGON Chapter 797, Laws of 1973 (Repealed by H.B. 2644 Laws of 1975)	Banks	S	Silent	Silent	Silent except if more than 4 units	General banking business				S	S	Notice only for first 4 units, approval for 5th or more
H.B. 2644 Laws of 1975	Banks SBs		Yes[12]	Yes	Silent	Yes	Yes	Yes	Yes	M	M	Notice only 30 days after installation or removal
RHODE ISLAND Chapter 290, Laws of 1975 (Wild Card)	Banks SBs S&Ls CUs	S	Silent	No	Provides that every financial institution may established CBCTs to the same extent and only during such periods of time that competing financial institutions federally regulated and domiciled in the state are permitted to provide. Supervisory approval is required. Sharing is permissive with all financial institutions.							
SOUTH CAROLINA Ratification No. 375,[13] Laws of 1975	Banks S&Ls CUs	S	No	Silent	Statewide	Silent						Yes
SOUTH DAKOTA H.B. 644, Laws of 1976	Banks	S	Yes	No	Statewide	Business of banking				M	S	Notice only
H.B. 878 Laws of 1977	S&Ls	L	Yes	No	Statewide	Savings and Loan Business				M	S	Notice only
TENNESSEE Chapter 274, Laws of 1977	Banks	L	Silent	Silent	"a state bank may exercise any power or engage in any activity involving the electronic transfer of funds which it could exercise or engage in if it were a national bank located in Tennessee"							
UTAH S.B. 44 Laws of 1977	Banks S&Ls CUs	S	Silent	Silent	MORATORIUM UNTIL JULY 1, 1979. Permits Bank Commissioner to authorize experimental EFT systems. (Should a Court or the Congress authorize establishment of EFT systems in Utah prior to July 1, 1979, then Commissioner shall grant financial institutions same authority.)							
VIRGINIA Chapter 535 Laws of 1976 (wild card)	S&Ls	S	The State Corporation Commission may adopt regulations defining what activities may be performed at an									
Chapter 554, Laws of 1976	Banks	S	Silent	Silent	Limited	Yes	Yes	Yes	Silent	P	P	Notice only
WASHINGTON Chapter 166-XXX Laws of 1974	Banks MSBs S&Ls	S	Silent	No	Statewide	Yes	Yes	Silent	Yes	Bank owners M P; MSBs & S&Ls P P		Yes
WISCONSIN S.B. 415 and S.B. 828, Laws of 1976	Banks S&Ls	L	Yes[14]	No	Statewide	"transactions which are incidental to the conduct of the business" of a bank or S&L				Banks & S&Ls[15] M M; Retail owners P P		Yes

1. Although this ruling has been rescinded, it is included in this chart because it was looked to by many states when they enacted legislation. Effective November 3, 1976, the Comptroller's Office issued revised procedures for national banks to establish CBCT branches in states where state banks are permitted by law to establish traditional branches or CBCT branches.
2. Permissive sharing within 50 miles; beyond that distance a CBCT must be made available to local financial institutions.
3. Home office protection is provided.
4. Other owners must share with banks; may share with S&Ls and CUs.
5. To the extent consistent with anti-trust laws, sharing is required.
6. The Bank Commissioner may establish rules and regulations for the operation and sharing of facilities to the same extent and effect as rules and regulations promulgated by the Comptroller of the Currency with respect to sharing and operation of facilities by national banks.
7. An association may not enter into an agreement to use a terminal at a location where other financial institutions would be prohibited from doing business.
8. A customer of an out-of-state financial institution may debit his account at an in-state terminal to pay for merchandise or services, provided the merchant credits an account in a Montana financial institution.
9. Non-discriminatory access must be made available to all financial institutions or branches located within the area that may use the terminal.
10. Commissioner may require sharing with institutions insured by FDIC or FSLIC.
11. Establishes parity with federally regulated financial institutions, including federal S&Ls.
12. Out-of-state bank may use facility if Oregon bank may use facility in home state of non-Oregon bank.
13. Provisions of act effective until July 1, 1977.
14. Out-of-state banks may use a facility in Wisconsin if consent is given by a Wisconsin bank using the terminal.
15. Savings banks may share facilities established by either a bank or savings and loan association.

The Michigan Bankers Association, for instance, has filed suit to ban a banking commissioner's order permitting state credit unions to issue share drafts.

In another one, the Justice Department has brought an antitrust action aganst the Rocky Mountain Automated Clearing House Association located in Denver. The suit charges conspiracy on the part of the bankers to deny credit unions and S&Ls equal access to clearing facilities.

These charts, recently updated by the American Bankers Association (ABA), give a state-by-state overview of legislation currently in force which covers EFT systems [CW, Dec. 6].

They detail which financial institutions are covered by law in each state, the nature of a state's bank branching law (S-statewide, L-limited branching, U-unit banking) and whether and under what conditions units owned by out-of-state banks are permitted.

The charts also illustrate whether a state treats remote facilities as branches.

For unmanned remote facilities, each state is reviewed to determine if and to what extent distinctions are made between manned units such as point-of-sale (POS) terminals and unmanned units such as automated teller machines (ATM).

If a state law permits unmanned remote facilities, the law is screened to determine where it permits a facility to be located.

The charts also examine whether a facility can accept deposits or dispense cash (W/D); if lines of credit or preauthorized overdraft privileges are available through the units; and whether transfers between accounts, such as savings and checking, are permitted (A/C Transfers).

Each law is examined to determine if an establishing financial institution must share its unmanned remote facility with other institutions and whether such sharing is mandatory (M), a permissive requirement (P) or silent (S).

The laws are also categorized to show whether institutions may or must share with like institutions — banks with banks, savings and loans (S&L) with S&Ls — and with unlike institutions (banks with S&Ls).

Finally, the ABA has examined whether the governmental official with jurisdiction over financial institutions must act to authorize a facility or if only notice of intent is required.

erisa event reportable?

An employer who knows, or should know, of any of eight ERISA reportable events, must immediately notify the plan administrator, who must notify PBGC within 30 days.

If your benefit management system cannot provide you with early warning of any of these events, Joe Nestor (617)851-4111, Wang Laboratories, Inc., Lowell, MA. 01851 can tell you about a new Wang software system for 360/370, Univac and Burroughs that can. . .

WANG

Editorial

The Dilemma of Reorganization

Just under a year ago a national commission recommended "that there be established in the Executive Office of the President an Office of Information Policy."

Instead of following that recommendation — made by the Domestic Council Committee on the Right of Privacy under then Vice-President Nelson Rockefeller — President Jimmy Carter has chosen to downgrade the role of the one agency dealing with information policy in the White House, the Office of Telecommunications Policy (OTP) [CW, July 25].

Like almost every issue to be faced by government, this one has two sides.

There is a crying need for reform and reorganization within the executive branch of the government. Unneeded agencies should be abolished, others need reorganization and still others need to be made more effective.

This was one of President Carter's main campaign themes and it will be one of his Administration's major thrusts.

On the other side of the coin, however, there is a need for a coordinated national information policy.

As the Rockefeller report noted: "A great number of public policy questions are being generated by advances in computer and communications technology, by shifts in the U.S. economy from a manufacturing base and by citizen demands for clarification of their rights to have and control information.

"The answers to the questions which are being raised will make up the national information policy, whether they are arrived at consciously or unconsciously, by commission or omission, carefully or haphazardly, in a comprehensive or in a piecemeal fashion. The issue thus is whether or not government will attempt to take a considered unified approach in arriving at these answers."

Frankly, we're stuck between a rock and a hard place, as the old expression goes. We feel reorganization is necessary, but there is also a need for a strong coordinated national information policy, with White House direction and support.

And that's the problem with the whole idea of reorganization — and a concomitant reduction — of government.

Most people agree it is a good idea — as long as it does not happen to their pet projects and interests. The environmentalists say "fine" to reorganization in principle, but "no" to abolishing the Council on Environmental Quality; the bureaucrats are all for it, as long as their agencies are not threatened; business is all for reduction in government, except for those programs that aid business; and so on ad infinitum.

Probably one of the reasons the OTP was among the first White House agencies to get the ax is that it does not really have a well-defined special interest group to support its existence.

Certainly the American Federation of Information Processing Societies (Afips), which wrote Carter in support of the OTP programs, cannot be considered a very effective voice for the agency. After all, it doesn't even take stands on issues, much less deliver the votes.

And generally — let's face it — the user and vendor communities are not very vocal on any of the major issues handled by the OTP. The only vendor organization that consistently takes stands in Washington is the Computer & Communications Industry Association; the user community has no representation at all.

So while the idea of a national information policy coordinated in the White House is a good one, it clearly does not have a constituency in the computer community, much less in the general populace.

It should come as no surprise, therefore, that the OTP will be one of the first casualties of government reorganization. Without strong support, it probably deserved to die.

Data Past

Five Years Ago
Aug. 2, 1972

WASHINGTON, D.C. — Sen. John V. Tunney (D-Calif.) introduced a bill requiring banks and other financial institutions to protect the privacy of their customers. His bill was an amendment to the Bank Secrecy Act of 1970 and would require banks, credit card companies and other "financial institutions" to treat all customer accounts as confidential. A subpoena, court order or the customer's permission would be required before any information could be disclosed.

— — —

OMAHA, Neb. — In a week of confusing legal activity, one court barred IBM from making a product announcement but was later overruled on an IBM appeal. IBM then said it would announce two models in the 370 series — the 158 and 168 with Virtual Storage.

Eight Years Ago
Aug. 6, 1969

NEW YORK — IBM introduced the System 3, designed for small business firms. The system included a 96-column punched card with 20% greater information capacity than the 80-column card, RGP-II and monolithic systems technology enabling switching speeds of 8- to 12 nsec.

Letters to the Editor

Are DPers Playing Charades Around Human Rights Issue?

I read the Reader Commentary in the July 18 issue ["Is Supplying DP Training to Iranian Police Ethical?"] with great interest. The subject was timely and one which I hope will receive greater attention in the future.

Jack Stone's argument did little to allay the concern I have for the way we relate as an industry to unjust or repressive institutions in our world.

In the final analysis, Stone stated that he would have violated the trust of his customer and ignored the foreign policy of our country if he had not taken the job.

I found Stone's comments quite disturbing, not because I believe him to be a bad man (which I don't), but precisely because I think that his arguments reflect the general or even "the highest level of ethical standards present in the computing industry."

If we let business interests outweigh human life and freedom in our consciences, then we are merely playing charades when we talk about our concern for human rights.

Max D. Bishop

Detroit, Mich.

On Being a Committee of One

I read the interchange between Saul Tannenbaum and Jack Stone on the ethics of Stone's training the Iranian police [CW, July 18]. I wish to comment.

I do not accuse Stone of unethical conduct since he is obviously unclear about the nature of the Iranian regime. But now that he has been told of the nightmarish character of that government, I believe it his duty to investigate further before undertaking any further assistance to it.

Stone asked, "Do I become a committee of one and reject my students and turn aside my customer and, in another dimension, discard the policy of friendship with the Iranian government, which is the established policy of the U.S.?"

He answers "No." I answer "Yes."

A person's behavior is his own responsibility, not that of his students, his customer or the U.S. government.

Alan Meyer

Baltimore, Md.

Articles on Report Writer?

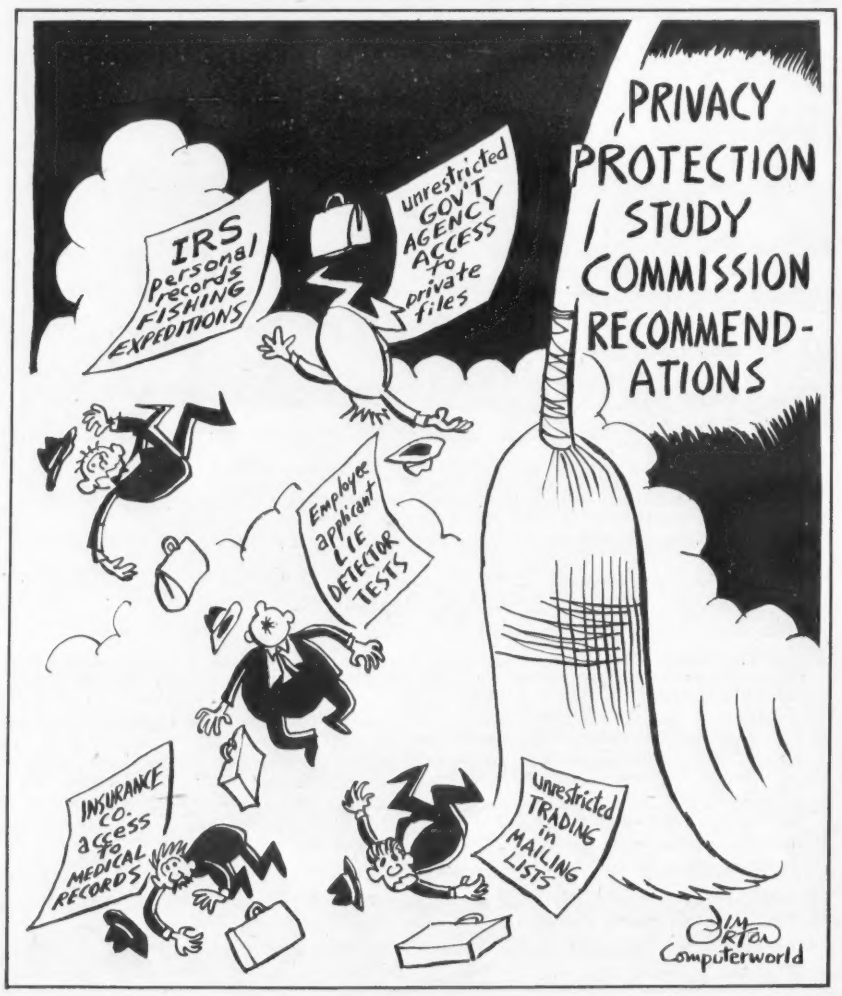
I am responding to William Englander's recent call for information regarding the Cobol Report Writer [CW, July 11].

I have been looking for comparison studies between the conventional use of Cobol write statements and the Cobol Report Writer features and have come across only one article on Report Writer, "Using the Cobol Report Writer," by Harry T. Hicks Jr. It appeared in the September 1972 issue of *Datamation*.

Like Englander, I also would encourage any CW readers to respond if they find any information concerning Cobol's Report Writer.

Randy Hargens

Portland, Ore.



A New Broom

DP Teams Need Greater Self-Awareness

By Jack Stone
Special to CW

Last week, I presented the first part of an interview with William J. Front and Carol M. Vaughan of the U.S. General Services Administration, who are exploring new ways of improving the organization, communications, member atttitudes and creative climate of the DP project team.

We talked of "team development," a set of strategies developed by behavioral science researchers which are designed to improve results from the project organization by creating a positive atmosphere of confidence and coordination. This situation is brought about by first matching individual members' needs and project needs more effectively, and then establishing a climate for interpersonal communications and cooperative activity.

In this column, we discuss the Frost/Vaughan application of the team development process to their DP communications problems.

Q: How have you addressed this rather challenging problem of building and developing successful project teams?

Frost: We have approached the team development problem just like any other DP project. The first step, of course, was setting down the objectives, which we did after considerable research and study. The first objective is to have each member of the project team assess how he or she works in a group and how he or she relates to the supervisor and other "nonsupervisors" in the work environment.

The second objective is to examine the current operating patterns of the project organization and to construct alternatives by examining the effects of human behavior on individual and organization achievement. The third objective is to have each member of the team learn new tools and techniques to help the team achieve creative, productive solutions to DP problems.

And the final objective is to have the team, as a functioning unit, apply these tools and techniques to team problems.

Q: What is the general format of the team development project?

Vaughan: The heart of the project relies on the team itself to use team concepts in solving everyday problems that affect the group; members manage their own learning and monitor their own behavior. But first they need some common understanding and goals. These are agreed upon in a two-day workshop led by a "facilitator" trained and experienced in team development.

The Human Connection

Q. And how is the two-day workshop conducted?

Vaughan: The first day and a half is devoted to meeting the first three objectives. Now, to help the team members assess, in effect, individual and team behaviors, we use a variety of techniques including survey instruments based on the "managerial grid" and the "Johari window," role playing exercises, instruction in the style and techniques of "brainstorming" and problem-solving and an introduction to the principles of team development and behavior.

Frost: Then, the final half day provides "live" workshop instruction.

A particular problem is selected by the group and is analyzed using the problem-solving techniques learned earlier in the class. The techniques, by the way, include a standard set of problem-solving steps whch is used by the team as a guide.

Obviously, the last half day is most crucial. Success of the class is in great measure determined by the openness and cooperative spirit of the team.

Q. The "Managerial grid" sounds interesting. Just what is this technique and how does it help team development?

Frost: The grid, as developed by Blake and Mouton, is based on the concept that a project manager has two major concerns regarding the final project product: concern about the project people and concern about project results. The grid is a two-dimensional graph which provides a representation of managerial style by plotting "people concern" on the vertical axis and "results concern" along the horizontal. Concerns are measured on a quasi-quantitative basis on a scale of 1 to 9. Thus a 9:1 manager is interested

(Continued on Page 14)

Australian Trade Law Causing DP Furor

The Taylor Report
By Alan Taylor CDP

Richard St. John of the Australian attorney-general's office explained that the recent contretemps between IBM and the Australian government, which resulted in "most" IBM products becoming unavailable there, at least temporarily, originated after Parliament amended the Trade Practices Act so as to protect the common-law rights of hospitals, businesses, schools, etc. — and those of "natural persons."

The common-law rights to which he was referring are built into the laws of most American states, as well as those of Australia and many other places, and they basically allow someone to recover damages resulting from improper behavior. However, it has until now been permissible for contracts to exclude such rights, and IBM has quite properly done so.

During the passage of the bill, St. John told me, there were no objections raised by IBM, but after the bill went into effect on July 1, IBM told the Australian government it was not prepared to work under the provisions of the act, because it created too great a risk for the firm. Other manufacturers followed the IBM lead.

Apparently the Australian government was unimpressed by this late claim, at least on the surface. It simply pointed out the company's prior silence on the matter.

That was as far as the issue had gone when this column was being written, although developments may have obsoleted this particular report by the time you read it. However, it seems unlikely that the basic situation which leaves Armonk and Canberra in a potential confrontation situation will be more than papered over at best. It is quite possible that this may be the nucleus which will show users here, as well as in Australia, just how much risk they are taking through accepting standard contracts. So let's look at the situation.

Australia & Computers

Australia's computers are currently being supplied by three different countries: the U.S., Japan and England. In real terms, however, the American interest is predominant, with only some 181 English-based systems and 18 Japanese systems reported in the May 1977 computer census figures, compared with some 1,200 U.S. systems.

IBM is predominant, both in the number of systems and in their size. There are, for instance, some 57 370s in the 145 or larger range and 24 360s at least 360/50s. There was a reported total of 312 IBM systems in the country.

Beyond the actual IBM-owned computers, the firm's influence goes further, with IBM services providing maintenance for IBM and non-IBM systems alike. Even where maintenance is not being directly handled by IBM, IBM is supplying the parts to the people who perform the maintenance. Potentially, therefore, it would be possible for an IBM withdrawal to effectively strangle the use of any or all of the 312 installed IBM systems.

The contracts IBM was offering prior to the current situation were no different from those they offer on a worldwide basis. As in the U.S., users in Australia were not protected from IBM's simply announcing it was changing the terms under which it operates. And, in fact, like most of IBM's customers worldwide, they received the April announcement of IBM's intention to change the contractual terms unilaterally, when it suited the corporation to do so.

Both the old contract, which is still operating, and the new terms IBM has said are coming greatly limit the ability of a user to make more than a small recovery of damage caused by IBM's misbehavior. These are the terms IBM feels it cannot live without, and these are at the center of the current dispute.

There have, of course, been situations in other countries before where IBM's contract terms were not acceptable. As far as I can find out, however, such countries, unlike Australia, have not been supporters of free enterprise. The continued use of any installed IBM computers was negotiable with some government body that would handle the purchase of spare parts, software, etc. on a countrywide level.

But Australia is different. There is no government agency which controls the computer sites and can negotiate as a unit. Australia falls into the standard user-to-IBM situation, and IBM may well feel that any substantial consideration given to the Australian user will have to be similarly provided to users in other countries.

Certainly the corporation would be hard put to explain to other governments why their nationals should not be equally protected from IBM errors as Australia's nationals.

Australia, however, would be equally hard put to explain to its voters why IBM should have any preferred treatment at the expense of Australian organizations.

Further Complications

The problem is further complicated by the current composition of the IBM board and that of the Carter Administration. The sight of T. Vincent Learson and the other former Ford Administration directors returning to their top-level positions when Carter came in makes any protestations of impartiality or separation from the company appear mere rationalizations of some legal fiction.

In fact, any pro-IBM action by the Carter Administration will probably — unless specially insulated from IBM connections — to be regarded as a use of U.S. influence to protect a private multinational.

And yet, unless matters are settled quickly (which seems unlikely, considering the scope of the controversy and the number of other U.S. firms that trade under similar contract conditions across the world) some U.S. government actions seems inevitable. American jobs in research and production are at stake as well as the property of a major U.S.-headquartered firm.

One can't just stand aside at that point and hope that everything will go away. Yet, currently the White House apparently has no plans as to how to insulate its actions from the IBM taint.

This suggests that accidental confrontation can very, very easily occur. Let us watch what happens and hope that computer users will find their situation improved, and not damaged, at the end of the battle.

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CCP Won't Replace CDP

Articles on Certification Rife With Paranoia

By Jim Brown
Special to CW

Three pieces on certification in the June 20 issue of *Computerworld* offered more misinformation and paranoia than fact. I refer to Ken Lord's fears of seeing the Certificate in Data Processing (CDP) outdated, John D. MacLean's letter calling licensing a "cop-out" and L.D. Rizio's reader commentary on licensing.

Ken Lord appeared 180° off course, MacLean was off on another tangent and Rizio had some good answers to the wrong questions.

Let's start out on the far end of the limb and try to bring all three back to the real world.

The Certificate in Computer Programming (CCP) exam will be offered by the Institute for Certification of Computer Professionals (ICCP) beginning Oct. 22. Contrary to Lord's "Corner" column, this certificate is in no way a replacement, substitute, prelude or "capstone" to the institute's already established CDP program.

The CDP program is directed primarily at business-oriented DP on the management or supervisory level. The CCP exam is targeted at the upper skill levels of those practicing business, scientific or systems programming.

These areas certainly can overlap as career paths, but as testing subjects and certification goals, the knowledge required of the successful candidate is markedly different. The accomplishment of either certificate is an end in itself.

There is room for both to coexist, as well as new exams in DP auditing, systems analysis or other potential subjects. One, both or more might be appropriate to an individual's goals.

MacLean's letter to the editor was obviously a reaction to the CCP program, although he failed to distinguish licensing from certification and, after raising legitimate content questions, did not carry through to see how or if such questions had been resolved by the CCP Certification Council under Dr. William Cotterman of Georgia State University.

What of MacLean's image of a poor programmer, born and raised in Autocoder? Is the ICCP going to force him, kicking and screaming, to learn PL/I against his will (wreaking havoc upon life, liberty and the pursuit of wordmarks?)

The exam covers programming, not coding. Emphasis is on techniques, thought organization and practices rather than language mechanics. Even more, anyone who claims, for example, to be a senior programmer in a business environment without having at least a reading knowledge of Cobol is smoking his tennis shoes.

The demarcation between certification and licensing is an important one. Certification carries no legal sanction, but licensing can stand in somebody's way of making a living. The distinction leads us directly to Rizio.

Rizio's commentary was certainly the most accurate of the three I have cited. The only point of contention is my belief — or hope — that licensing is a possibility far more remote than Rizio seems to think.

The point that "we are not knowledgeable enough to be able to detect all fraudulent activities, improper procedures or poor systems designs" is well taken. Licensing would attempt to force good practices, but certification addresses the issue from a different angle.

Certification encourages continuing education and expansion of the individual's capabilities. Secondly, it serves as a consciousness-raiser to alert people that ethics, good practices, codes of good conduct and responsibility are indeed considerations for each individual to address. Read Donn Parker's fraud studies and find out how many people didn't even think they were doing anything wrong.

Revoking a license cannot enforce that consciousness, but encouraging a certificate can engender it.

The ICCP, representing eight professional societies on the subject, said in January of 1975 that ". . . at the present time there are no generally accepted definitions of job functions . . . or agreement upon knowledge and skills to practice in those jobs. Consequently, licensing will be premature until the needs stated above are met."

One might speculate whether those needs can ever be met.

Can you define a "professional" in data processing? Don't look in a mirror — yet. "Professional" is the greatest buzzword to hit recruiting ads since "Equal Opportunity M/F." How does "professional" tie in with certification?

Certification provides a uniform measure of knowledge and performance potential. To the practitioner, the certificate is a credential of substance in self-assessment and peer group evaluation.

Certification offers a challenge, and willingness and ability to meet that challenge is a good working definition of professionalism. Some feel that DP won't be a profession until we fit into the mold of doctors, lawyers and accountants.

Until Marcus Welby operates on a data base or Perry Mason solves his first core dump, we need to look for images without so much romanticism.

Brown, manufacturing systems project leader for Crane Co. in Chicago, is on the boards of directors of the ICCP and the Association of Computer Programmers and Analysts.

Reader Commentary

Teams Need Awareness

(Continued from Page 13)

in results to the exclusion of people, and a 1:9 manager focuses on humanistic concerns to the exclusion of results.

Vaughan: We administer contrast surveys based on the grid during the class, one for supervisors and one for nonsupervisors. These surveys enable each individual team member to plot his dominant and backup styles. As the results are discussed, each team member becomes quickly aware of the attitudes he brings to the team.

Q. And the "Johari window"?

Frost: This is another graphical technique which helps team members understand the dynamics of team communications. We have a style of rectangular plots which present a simplified model of the interactive communications process. On the horizontal we plot information that ranges from that which is known to that which is unknown to the *individual*. On the vertical axis we plot information that ranges from that which is known to that which is unknown to *others*.

Vaughan: We use contrast surveys based on the "Johari window" to provide insight as to how the manager believes he is communicating to employees, in contrast to how the employee perceives this communication.

Since there is usually a disparity which can be depicted on the graph on a quasi-quantitative basis, the group can proceed to examine the causes for this misunderstanding and take action to adjust.

Q. Will you comment on the results of your explorations thus far?

Frost: Surely. We have implemented a number of programs during the past three years. Although they must still be considered as pilot in nature, we are pleased with the results thus far.

We have documented the results in our paper "Within Context — The Application of Team Concepts to Work Teams," to be delivered at the annual meeting of the Association for Computing Machinery Special Interest Group on Computer Personnel Research, which takes places on Aug. 18 and 19 in Washington, D.C.

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SOFTWARE & SERVICES

'Abend-Aid' Aids MVS

CLEVELAND, Ohio — Release 2 of the Abend-Aid source-level debugging tool from Tomark is said to eliminate the potential conflicts this package might have with others attempting to do specialized Abend processing.

The package controls and formats the information dumped on the printer when the system hits a program check causing an abnormal end of execution of the then-current program. Users can select the data and format, if any, they wish for each type of Abend.

A major enhancement in the new release protects the user from losing data in the event of recursive program checks. Another enables the debugger to be used in an MVS environment, a spokesman noted.

For users working with data bases, the Abend-Aid update also provides for the diagnosis of IMS completion codes for both batch and on-line program crashes. The package traces the control chain to the application program level, he said.

Abends occurring in an IMS environment can be handled differently from the same abends in a non-data base setting, he stated, and an IMS user code Abend extension is now being tested.

Price of the package is $2,975 for OS/VS systems and $3,975 for MVS installations, Tomark said from 5645 Beacon Road, Cleveland, Ohio 44131.

'Dynam/D' Controls Pooled Disk Space

NEW YORK — Support for pooled disk space and for several versions of individual files are among the enhancements built into release 1.1 of Dynam/D, the disk space and catalog management software system for IBM DOS and DOS/VS from Computer Associates, Inc.

The package determines space available on a specified disk and dynamically allocates that space as a file is opened, not before the job is initiated. The package also allocates additional space if the space originally requested isn't enough, a spokesman explained.

The disk pool management facility allows the user to select from a group or pool of disk volume serial numbers to be used for the space allocation. Disk space allocations can therefore be set up to relate to the partitions in which a program is executing.

In this way, a better balancing of disk use is achieved, the spokesman claimed. The user can also define protected areas on any disk and these would never be used by Dynam/D, he added.

The generation data set facility is especially useful when an installation has a need to create and be able to access multiple generations of a given file, he said.

Facilities to backup and restore direct access storage device files are also part of release 1.1, allowing the user to save a disk file on tape and bring it back later to disk.

A display facility for the Dynam/D catalog file enables the user to determine all the attributes related to any file defined in the catalog.

An interface between Dynam/D and the vendor's CA-Sort allows work space on sorting tasks to be released after the input file has been initially read by the sort system.

Dynam/D is available for as little as $5,000 depending on options selected, Computer Associates said from 655 Madison Ave., New York, N.Y. 10021.

'Price' System Estimates Software Costs, Timing

MOORESTOWN, N.J. — DP managers can now get help in estimating the costs involved with major software projects by utilizing the Price S modeling system from RCA, which has been installed on several remote-computing service networks.

Price S is said to permit rapid evaluations based on project size, type difficulty and scheduling constraints. System configuration, desired percent of system utilization and reliability requirements are also factored into the model, a spokesman noted.

The system is an interactive operation with conversational input and output, structured around regression techniques and internal self-checking to validate the input before it is used, he said.

In addition to definitions of the technical aspects of the project, Price S also accepts user-selected economic and technology growth factors to produce cost breakouts of five categories in each of three overlapping development phases. The categories are systems engineering, programming, configuration control, documentation and program management.

Resource expenditure profiles are provided for each of the development phases — engineering design, implementation and test and integration — together with controls that will adjust these profiles to user requirements, the spokesman explained.

Operation Modes

Normal operation computes costs directly from user inputs. Ecirp mode, on the other hand, enables Price S to run "in reverse" to calculate empirical data factors from known project costs — an "extremely useful" feature for model calibration, he added.

Geosyn, the third mode of operation, uses specified costs to compute typical program sizes and project schedules. This allows Price S to be used to investigate feasibilities and to set scope-of-work goals for design-to-cost efforts, he continued.

Network Choice

Price S is currently on the American Information Services network, based in Greenwich, Conn., and the On-Line Systems net, headquartered in Pittsburgh. Unlimited use of the system through one terminal is available for $30,000/year (payable to RCA) plus the cost of the service vendors' resources.

RCA also offers a three-day training course, at $600/trainee, the spokesman said from the company's Government Systems Division, Moorestown, N.J. 08057.

Package Eases Quick Chores

NATICK, Mass. — The Info-32 package from Henco, Inc. has been described by the vendor as a data entry/inquiry/report generator system based on a minicomputer. It enables users to conversationally gather, organize and maintain information, a spokesman explained.

The system supports the storage of both data files and processing routines, either of which can be accessed by name. Once in use, the data can be refined through selection criteria and the processing can be modified to meet new needs, letting the user work with what he wants, the spokesman added.

Written principally in Fortran, the system has been implemented on Honeywell Level 6 and Interdata minicomputers and on an Amdahl mainframe, according to the company.

Info-32 is available for a one-time cost of $4,000, or for $1,500 plus $150/mo for 24 months, Henco said from 215 Oak St., Natick, Mass. 01760.

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IN SYSTEMS-HOUSES

'Roscoe' Update Adds Vtam And Basic Compiler Option

PRINCETON, N.J. — Version 4 of Roscoe, the conversational remote job entry software from Applied Data Research, Inc. (ADR), is said to include more editing commands, Vtam support for IBM 3270s, closer links with ADR's Librarian and, for an extra fee, a Basic compiler.

The package provides program preparation, testing and maintenance services to personnel working at remote terminals operating under IBM's OS and OS/VS environments. These services include data entry and editing, library storage, syntax checking, job submission and output retrieval, programmed prompting and job stream generation, ADR said.

Changes in the logic of the Active Work Space (AWS) or interactive editing area not only support the new edit commands, but also reduce I/O and increase flexibility in the number of lines that can be manipulated concurrently, a spokesman claimed.

The Vtam support for 3270s includes local linkage, Bisynchronous and Synchronous Data Link Control (SDLC) protocols, the company said.

The Immediate-Update Librarian feature is said to support maintenance of Librarian master files from within the Roscoe region or partition. Described as a reentrant subset of the Librarian package, it is loaded under Roscoe command control and supports "all common Librarian functions," the spokesman stated.

The Minibasic special option is a "code-and-go" implementation of Dartmouth Basic which runs as a Roscoe monitor routine.

Programs best suited to Minibasic are those whose processing is mainly conversational with I/O generally restricted to working with the terminal, according to ADR.

Version 4 of Roscoe is available for a one-time cost of $28,000. Minibasic costs an additional $4,500 under the same arrangements. Each is also available under rental or lease plans.

ADR is at Rt. 206 Center, Princeton, N.J. 08540.

Tymshare Adds Personnel Runs

CUPERTINO, Calif. — The Personnel Evaluation and Reporting System (Pers) on the Tymshare, Inc. remote computing network can help personnel analysts and management run a company's Affirmative Action program and produce reports required by federal authorities, Tymshare said.

Pers accepts a firm's Affirmative Action data in raw form and transforms it into standard Equal Employment Opportunity Commission (EEOC) information reports. Other available reports include detailed rosters for internal monitoring and updating, a spokesman added.

But Pers is more than a compliance tool, he said, claiming it provides accurate, timely reporting and analysis to enhance management control of human resources and to increase staff productivity with minimal clerical effort.

The system enables users to access census data and data bases on industry salary levels. In addition, the network has personnel consultants available to help users structure and perform analyses and interpret data, the spokesman noted.

Tymshare's nationwide network is based at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Cosmic 'Pert Time' Runs on CDC CPU

ATHENS, Ga. — Pert Time III, now available from Cosmic, is a program evaluation review technique (Pert) system for Control Data Corp. 6000 CPUs that monitors and schedules various activities within a particular project through use of a time-oriented network structure.

The package accepts data from cards, tape or data cell and produces 21 fixed reports and as many as 20 variable reports, schedule and resource plots and an updated activity tape or data cell, according to a Cosmic spokesman.

Formally cataloged as LAR-11887/-CW, the package requires 52K octal plus 1K octal for each 230 activities or events. It operates in batch mode, has a plotting option using a California Computer Products, Inc. plotter, is distributed on NOS internal format tape and costs $930.

Cosmic is at 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

Project Control System Revised

LOS ANGELES — J. Toellner & Associates has introduced an enhanced version of its Spectrum-2 multivolume set of project management and documentation guidelines for DP shops with modestly sized staffs.

The update includes all required standards, forms and procedures for the development of new systems and the maintenance of existing ones, a spokeswoman claimed. The estimating guidelines for large and small projects, originally published in Toellner's Spectrum-1 series for large staffs, are included in this version of Spectrum-2, she said.

Spectrum-1 is a 20-volume set of loose-leaf books, each focusing on the needs of a particular position or function within an organization. Spectrum-2 is smaller in scope, with material from Spectrum-1 compressed or eliminated to make the series more appropriate to the smaller staff, she explained.

Spectrum-1 support includes 150 hours of consulting work; Spectrum-2 provides 40 hours of implementation assistance to train the user staff, set up management priority committees, alter the procedures to local conventions and get the first few projects going.

Spectrum-2 costs vary with the size of the user staff. The system is available beginning at $10,000 (for staffs up to 10 in number) to $22,000 (for groups of 20 to 25), she said from 4311 Wilshire Blvd., Los Angeles, Calif. 90010.

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Modeling System Leads to Savings Formula

BIRMINGHAM, Ala. — Today's business environment is just too complex to base million-dollar decisions on gut-level feelings. Each year more and more variable, often uncontrollable conditions cloud management's view of where a company is today and where it's heading.

Today, many decision makers use a modeling program as a tool to weight alternatives and meet these challenges.

One such example can be seen at Vulcan Materials Chemicals Divison, a relatively young member of the parent Vulcan Materials Co., headquartered here, and one of the nation's leading producers of industrial chemicals.

The division, which markets a diversified line of chlorinated solvents, including carbon tetrachloride, chloroform and perchloroethane, accounted for almost two-thirds — nearly $35 million — of total company earnings last year.

Remote Service

As part of its effort to continue this success, the division is now using the Mathematical Programming System (MPS), a modeling capability on the General Electric remote computing network, to examine alternatives for day-to-day decisions as well as long-range planning.

"The chemicals industry is dynamic and highly competitive," according to Ray Heyd, manager of marketing research and the man responsible for the divison's use of MPS. "Today's decisions may have a dramatic effect on tomorrow's business climate, even to the point of survival."

This is particularly true of Vulcan's primary product line, the so-called commodity chemicals used in the cleaning of metals and textiles and as intermediate chemicals in the manufacture of other products.

"Commodity chemicals are generally high-volume and low-margin types of products, Heyd said. "But we feel our modeing capabilities give the division an added edge against competition."

Vulcan's success-oriented management guides the operations of chemical plants in Wichita, Kan., Denver City, Texas, and Geismar, La. Although only about 15% of its modeling system is completed, manufacturing process changes tested by the system have helped establish a trend toward increased profits, Heyd said.

Charles E. Sturgeon, vice-president of manufacturing for the division, noted "a method for increasing profits by more than $6,000 a day has been analyzed and put into operation at our Wichita plant. While we regard this as a great success, the net effect in terms of increased efficiency and profits at other plants could be even more significant."

Such a dramatic increase in plant profitability as a result of manufacturing process changes was, according to Heyd, "something Sturgeon had a feel for from the beginning, but modeling allowed us to test his idea for a matter of dollars rather than the large capital investment necessary for plant modifications."

Optimistic About Future

Heyd is optimistic about future successes. "We've really only scratched the surface," he said. "We have many other plants which can be modeled just as in Wichita with similar results."

Sturgeon also sees the system as a boon to the division's business. "We've involved in a number of very important 'what-if' games that hinge on our ability to discern the best possible alternatives," he said. "Ultimately, our models will be used throughout the division, providing us with an integrated optimization planning system of almost unlimited potential."

In addition to modeling production processes, Vulcan

(Continued on Page 19)

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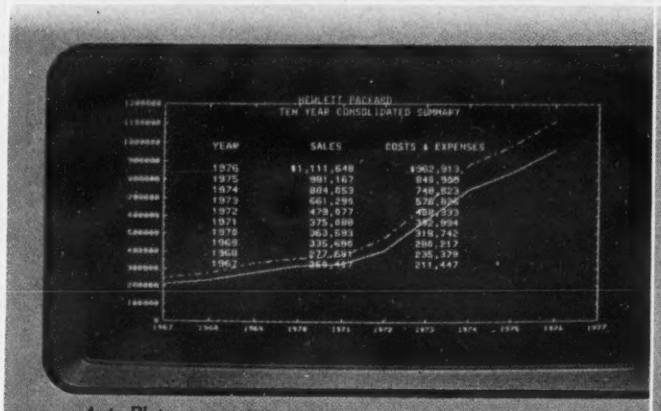
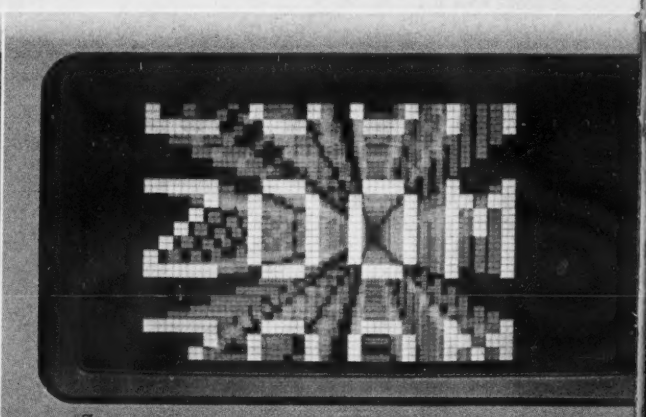
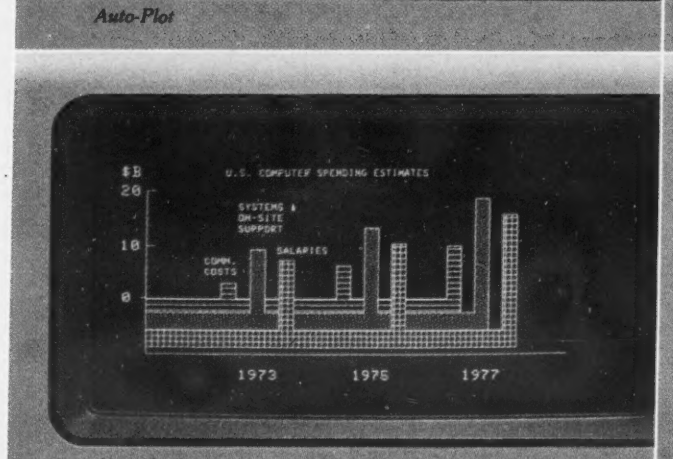


Auto-Plot



Zoom



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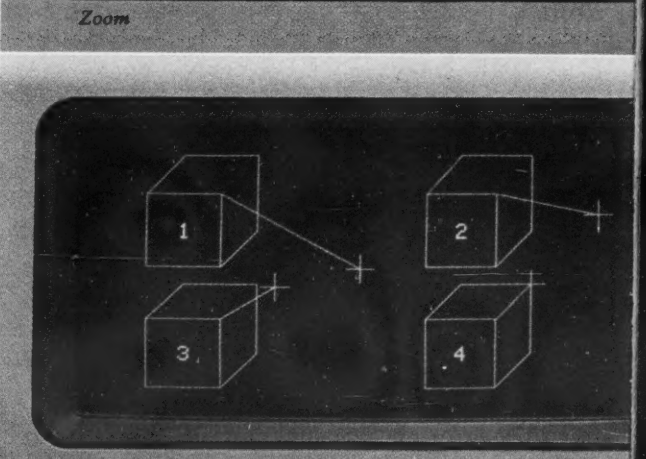
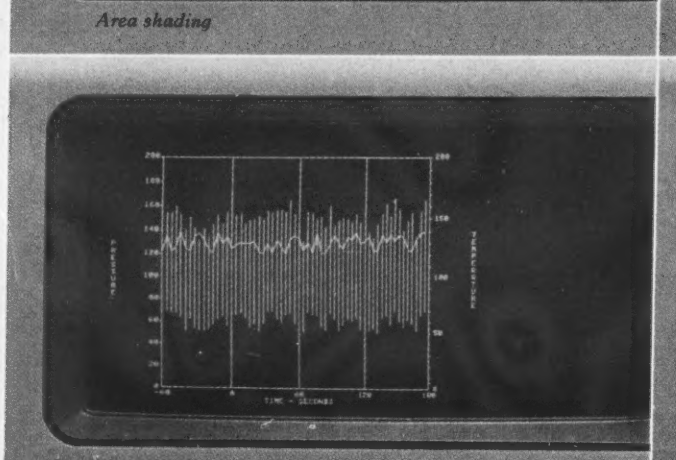
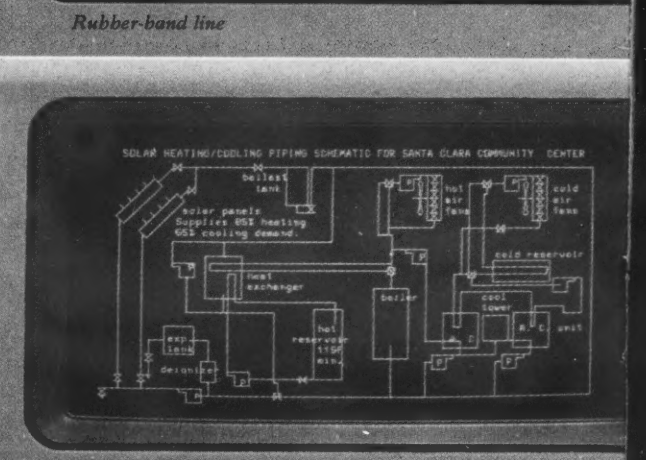


Rubber-band line



Typical application: scientific plotting



Typical application: process flow diagram

'Vserv' Maps DOS Disks

COSTA MESA, Calif. — Keyed to IBM DOS and DOS1-VS installations, the Vserv package scans volume tables of contents (Vtoc) to allow more efficient space allocation and support a "definitive" management of direct access storage devices, according to its vendor, Management Systems Co. (MSC).

The software solves disk management problems by providing a "comprehensive" device mapping facility and Vtoc access capabilities, according to a spokesman. The options allow the user to identify wasted disk space.

Vserv consists of a 15K program and a B transient, distributed on magnetic tape. A user guide is "self-generated" by the Genserv macro included in this $400 package, MSC said from 3185-D Airway Ave., Costa Mesa, Calif. 92626.

A Model Approach

Planning System Brings Savings

(Continued from Page 18)

hopes to also examine plant expansion alternatives with the system, Heyd said.

"The expense of building a new plant vs. adding facilities to an established plant can be measured by mathematical simulation on the system at minimal cost," he said. "Of course, this becomes a particularly important capability with escalating construction costs."

Also of concern for Vulcan is the effect of increasingly stringent environmental controls. Here, the ability to analyze and quickly adjust to changing environmental factors is critical, Heyd explained, giving as an example the uncertain future of fluorocarbons in aerosol use, which could affect the production of several of Vulcan's products.

Another area which benefits from Vulcan's far-reaching system is the choice of raw material feed stocks used in manufacturing chemicals. "Our model can now help us determine where we can get the best buy for our investment," Heyd said, "and the result is the optimal choice of feed stocks."

Vulcan's modeling system will continue to expand, according to Heyd. Scheduled for operation in the near future is a transportation matrix which will further enhance the division's efficiency and profit potential.

"Basically, the transportation matrix will allow us additional input in determining the manufacturing of shipping points for a certain chemical depending upon the location of the user. That way, transportation costs can be significantly reduced while at the same time increasing our ability to quickly serve customers," Heyd noted.

Vulcan management decided on the Mark III service after studying a variety of available processing alternatives, Heyd said. "Even our in-house processing could not match GE's economy of use."

Cassette Course Links DP, Audits

WOODLAND HILLS, Calif. — An integrated DP and audit control approach is said to be the backbone of the Auditable Internal Control Systems (Audics) audio cassette training program from Info 3.

The package is aimed at management, financial staffs, DP users, auditors and DP professionals. It shows each of these groups the needs of the others, the vendor said.

More information about the 12-booklet/10-audio cassette course is available from Info 3, 21241 Ventura Blvd., Woodland Hills, Calif. 91364.

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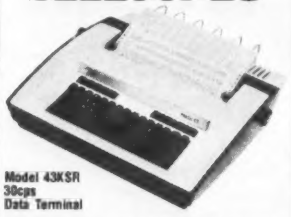

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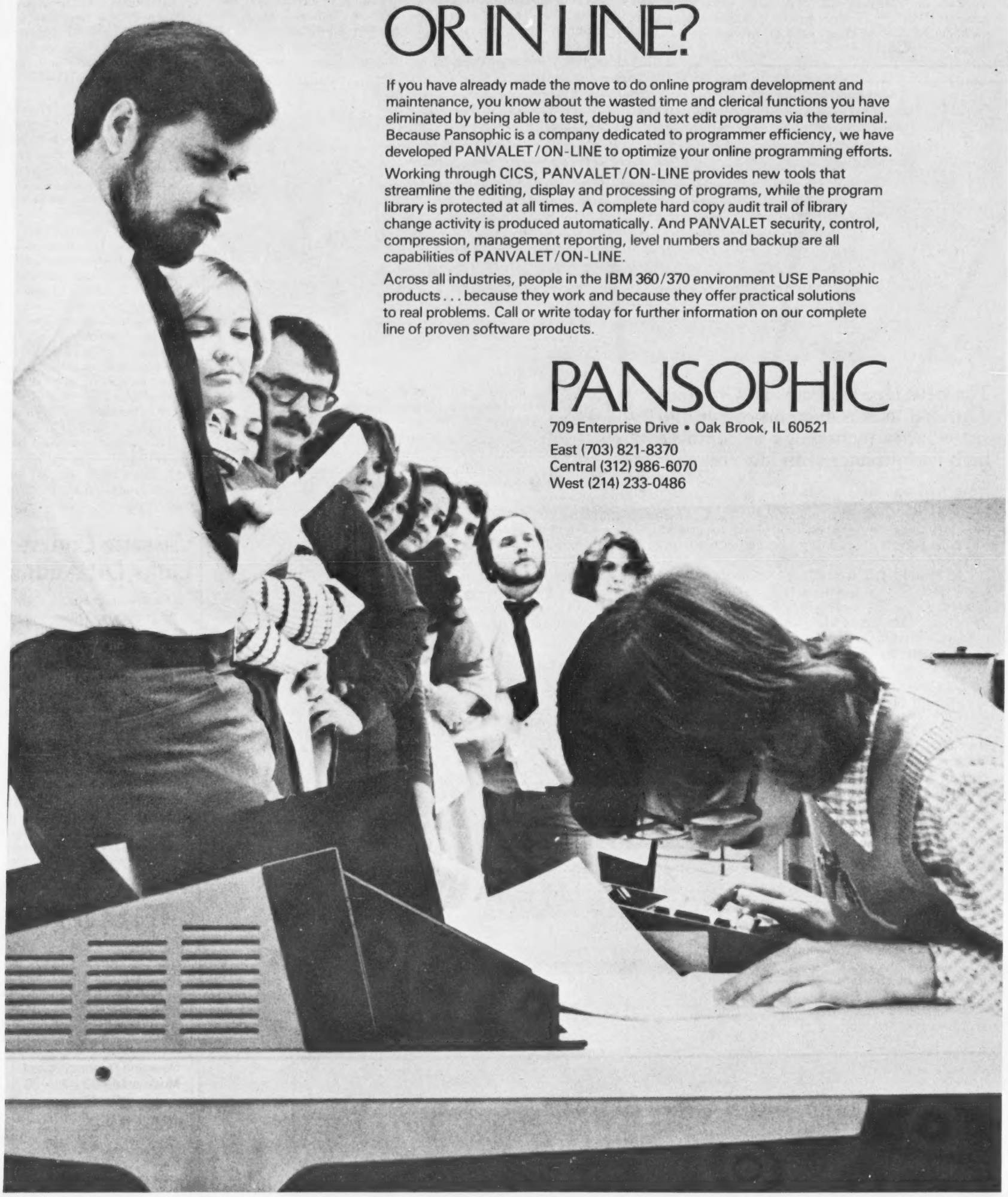


COMMUNICATIONS

Data Briefs

SBS Earth Station Set For Third IBM Site

McLEAN, Va. — Satellite Business Systems (SBS) has applied to the Federal Communications Commission (FCC) to construct an earth station on IBM premises at Research Triangle Park, N.C.

When completed in mid-November, it will be the third earth station in the preoperational program of SBS, which is an IBM, Comsat General Corp. and Aetna Casualty and Surety Co. joint venture.

Along with existing SBS earth stations at IBM sites in Poughkeepsie, N.Y., and Los Gatos, Calif., the station near Raleigh, N.C., will be used for common carrier, private line, voice and high-speed data communications services to IBM, according to an SBS spokesman at headquarters here.

SBS plans to begin the common carrier services to IBM by the beginning of next year. The preoperational program is a prelude to the carrier's full operational system of satellites and earth stations, scheduled for completion by late 1980, SBS stated.

Centronics Adds APL Set

HUDSON, N.H. — Centronics Data Computer Corp. has added an AL character set and engraved APL keyboard option for its Model 761 keyboard send/receive and receive-only teleprinters.

The option features a nine-pin print head that produces 7 by 9 dot-matrix characters with underscore and ascenders and descenders on the primary Ascii character set, according to a spokesman.

The APL option adds $450 to the price of a Model 761, he said from Hudson, N.H. 03051.

Omnitec Adds Acoustic Coupler

PHOENIX — Omnitec Data Corp. has added the Model 401D acoustic coupler to its acoustic coupler and modem product line.

The 401D can transmit at 450 bit/sec and optionally at 600 bit/sec. It has RS-232 and current-loop line interfaces in one connector; half- and full-duplex transmission capabilities are shown by indicator lights, Omnitec stated.

The coupler sells for $320, the company said from 2405 S. 20th St., Phoenix, Ariz. 85034.

Survey Finds Users Like Private Facilities Best

By John P. Hebert
CW Staff

DELRAN, N.J. — Although data communications users' first love is privately built facilities, users of both Western Union International (WUI) and MCI Telecommunications Corp. services said those facilities were almost as good overall.

According to a recent Datapro Research Corp. survey report called "All About Data Communications Facilities," the WUI and MCI user ratings came within small fractions of a percentage point of each other and of privately built facilities on a four-point scale in the categories of installation ease, operational reliability and promptness of repair.

The results on user experience are contained in the 29-page report, which also describes and analyzes the communications services supplied by the telephone companies and other common carriers.

The survey of communications users drew 809 usable responses reflecting experience with more than 10,000 communications links over an aggregate network of two million miles, according to the research firm.

User responses were assigned numerical equivalents for ratings from poor (1) to excellent (4) and were converted to weighted averages for all users of each carrier or facility type.

Reliability of Operation

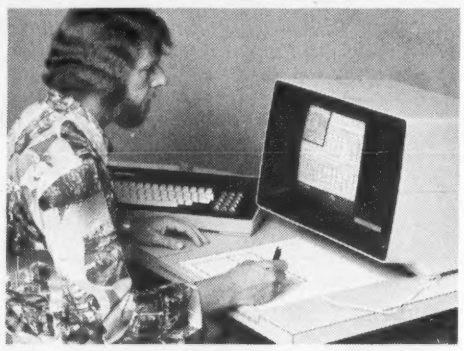
Grouped together, the specialized common carriers were rated as good as the Bell System in the category of reliability of operation (3.1), although WUI and privately built facilities gathered most points from users with ratings of 3.4 and 3.5 respectively, ac-

(Continued on Page 23)

Nugraphics Raster Scan CRT Touted as Tektronix Alternative

SANTA CLARA, Calif. — Nugraphics has unveiled the Cluster 1000 CRT graphics display terminal, designed as a raster scan technology alternative to the storage display terminals made by Tektronix, Inc.

The CRT presently can be used with the



Cluster 1000 With Optional Tablet

Data General Corp. Nova 2 CPU, Nugraphics stated.

The Cluster 1000 uses 1M bit of random-access memory in an Intel Corp. 8080 microprocessor to refresh its digital CRT display at 60 Hz, according to a spokesman.

The basic terminal includes an IBM 2741-type keyboard with 20 function keys for cursor, picture and other control functions; the CRT; and an RS-232 interface.

The 416 by 312 picture element image is treated as a movable camera, viewing the 1K by 1K-bit picture data base. As such, the spokesman explained, only initial picture loading and permanent changes require attention from the host CPU.

The graphics terminal features local implementation of panning, zooming from 1X to 8X, multiple split screens, write-through and background grids, Nugraphics stated.

In addition, up to 16 Cluster 1000s can share a parallel port on one host CPU with the addition of an optional interface.

The Cluster 1000s are capable of bidirectional data transfer through the parallel interface data channel at speeds of 66.6 kbyte/sec or higher, Nugraphics claimed.

Each of the terminals internally buffer 512 bytes of data for efficient use of the data

(Continued on Page 23)

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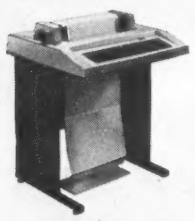

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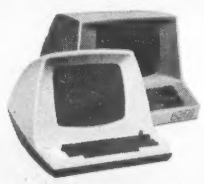

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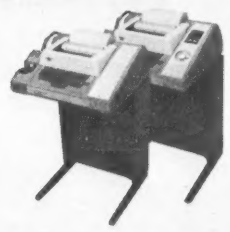

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USTS Files Tariff Changes To Alter Private Line Rates

NEW YORK — U.S. Transmission Systems, Inc. (USTS), a subsidiary of ITT Corp., has filed changes to its tariff with the Federal Communications Commission (FCC) to modify its rate structure for single- and multiple-channel private line service.

The changes are scheduled to be effective Sept. 25, USTS said.

Generally, the rate change will increase rates for short-haul traffic and decrease rates for long-haul traffic. Approximately 65% of USTS customers will receive a rate hike while 35% of the customers will experience decreases, the company said.

Special features of the revised tariff include the addition of three discount mileage rate bands, the incorporation of the channel termination charge into the line haul rate and the elimination of the distinction between two-wire and four-wire local distribution channels, according to the carrier.

The rate changes are expected to increase revenues by approximately 4%, based on the current customer mix.

The line haul rates in the revised tariff utilize eight mileage rate bands and offer customers a range of prices from a $5.90/mile rate for circuits up to 10 miles in length to a flat rate of $770 plus 38 cent/mile for each mile over 1,250.

The change also will reduce the number of multiple channel discount categories from eight to five offering variations at 12-channel intervals beginning at 24 channels and ending at 60 channels, USTS added.

USTS is located at 67 Broad St., N.Y., N.Y. 10004.

RFL Card Aids Remote Tests

BOONTON, N.J. — RFL Industries, Inc. has a loopback circuit card designed to test remote modems and communications lines from a master station.

The 68 Loopback Card operates in conjunction with RFL's Model 6850 and 6385 FSK tone equipment to loop back the digital interface or the communications line at a remote location, according to the firm.

Supervision of the loop back functions is accomplished at the master station by manual or computer-controlled switching, RFL stated.

The 68 Loopback Card can be equipped with TTL, CMOS, MIL, CCITT or EIA interfaces and costs $170 from the firm at Powerville Road, Boonton, N.J. 07005.

Modem Replaces Vadic 3400

PALO ALTO, Calif. — Prentice Corp. has unveiled a two-wire, half- or full-duplex 1,200 bit/sec modem designed to save users money by reducing on-line computer time.

The modem is a cost-effective alternative to the Vadic Corp. 3400, according to Prentice.

Buffered Version

The P-1200-Plus is a buffered version of Prentice's Model 1200/150 modem. Buffering allows simulated 1,200 bit/sec full-duplex transmission over dial-up or two-wire leased lines, according to a spokesman. The unit interfaces with keyboard send/receive KSR types of data entry keyboards in an echoplex environment.

Available in both answer and originate versions, the P-1200-Plus is geared for varying line conditions and replaces existing Bell 103-type modems in higher data rate, interactive applications, the spokesman stated.

The modem operates in any system interfaced with a manual or automatic Data Access Arrangement (DAA) and connects with standard EIA RS-232 or Teletype Corp. compatible adapters.

The price of either version of the P-1200-Plus is $560 from Prentice at 795 San Antonio Road, Palo Alto, Calif. 94303.

Teleray Unit Uses Minidisk

MINNEAPOLIS - Research, Inc.'s Teleray Division has introduced an ASCII floppy disk terminal that uses 5-1/4-in. minidisks for storage and fast random-access retrieval of data, the firm said.

Designated the Model 2020 Teledisk, this unit will store and transmit the equivalent of 37 CRT screens of data (71.68K characters) or 13.5 pages of 8.5 by 11-in. printed material, it added.

Teledisk has two RS-232 interfaces for attachment to any asynchronous Ascii terminal and modem, the company noted.

The 2020 can be operated in read, write, find, insert, erase and address modes with operator prompting; it is compatible with Bell 103, 113 and 202 modems, the firm added.

The unit costs $1,750 from Research at P.O. Box 24064, Minneapolis, Minn. 55424.

Users Like Private Facilities, Datapro Finds

(Continued from Page 21)

cording to Datapro.

Western Union (not WUI) trailed in the reliability category with a rating of 2.7, and the other telephone companies received an overall rating of 2.4.

The 29 users of private facilities said those networks were relatively easy to install (3.4), while the 563 Bell System users gave their facilities' installation a 3.1.

The specialized carriers garnered a 2.9 from their 34 users; Western Union received a 2.7 from 31 users, and the 102 respondents using the other telephone companies' services rated those facilities' installation 2.4.

In terms of repair promptness ("quickness to troubleshoot and correct problems"), the privately built facilities were again given the best rating (3). Specialized carriers took second place with a 2.8, followed by Bell with a 2.7.

User ratings of satellite channels, Canadian facilities and European facilities were also included in the survey results.

Taking the average of weighted averages in all three rating categories, the privately built facilities came out ahead with a score of 3.3. WUI followed with a 3.27 rating, and MCI brought up the rear of the top three with a 3.2.

AT&T's rating from users of its various services was 2.97 in all three categories; satellite channels were next with a 2.93 overall; Southern Pacific Communications Co. received a 2.9 overall; and other specialized carriers had a 2.7.

Western Union was given a 2.63, European facilities a 2.46; Canadian offerings a 2.43; and telephone companies other than the Bell System received the poorest rating overall in all three categories with a 2.33.

Ratings By Services

It is difficult, however, to compare one vendor's offering with those of others, because all are different in at least some ways.

Because of this, Datapro broke out users' ratings for each vendor and types of services offered by each. Bell, for example, was broken down into six different types of facilities or offerings and private facilities were broken down into four separate categories.

In addition, the report also lists all vendors' facilities, rates and service areas grouped in terms of facility type.

Datapro found some usage patterns have changed since the last survey was conducted one year ago. Among those findings: more users are turning to front-end processors to offload the communications functions from the mainframe; and more are employing transmission speeds of 4,800- and 9,600 bit/sec.

"All About Data Communications Facilities" is available for $12 from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

Nugraphics Has Raster CRT

(Continued from page 21)

channel in a burst mode, it added.

The RS-232 interface allows communications with the host at speeds up to 9,600 bit/sec under direct memory access through network links, the spokesman noted.

The Cluster 1000 can pan or zoom and add or erase a single item to or from the picture and display and change messages from the host CPU with built-in hardware, according to the firm.

In contrast, the Tektronix 4014 requires a picture redraw to achieve these functions, Nugraphics said.

The Cluster's display tube costs about $100 to replace, while the 4014 storage tube replacement cost is about $2,000, the vendor claimed.

Messages and message changes are displayed on the Cluster monitor through its split-screen technique and reportedly do not interfere with the stored picture or require redrawing.

The terminal also offers six different arrangements of split screens containing up to three split areas per screen. The feature, according to the firm, provides for simultaneous display of messages and graphics or of a picture with a zoomed close-up. There is no comparable 4014 feature, Nugraphics claimed.

Cluster Prices

The basic Cluster 1000 is priced at $14,990. A Summagraphics Corp. adapter costing $2,000 facilitates parallel communications to the Nova CPU and also allows up to 16 Cluster 1000s to be daisy chained to one host CPU port, according to the spokesman.

An optional operator station tablet is priced at $3,950. Nugraphics is developing an interface for the Digital Equipment Corp. PDP-11 minicomputer, the spokesman noted from the firm at 3012A Scott Blvd., Santa Clara, Calif. 95050.

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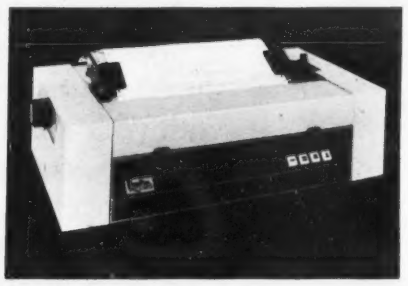

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MDS Units Increase Distributed Options

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) has added six products for use with its Series 21 product line for distributed data processing applications.

The Series 21 products introduced include:

- An MDS-compatible channel (Feature 180) for linking Series 21 systems directly to other MDS systems.
- The Model 2142-1 printer for 90- to 240 line/min operation.
- The Model 2142-2 printer for 230- to 340 line/min operation.
- The Model 2145 printer for 600 line/min operation.
- The Model 2481 tape drive for 9-track, 800 bit/in. operation.
- The Model 2482 tape drive for 9-track, 1,600 bit/in. operation.

The three higher speed printers will give Series 21 users increased printing flexibility over the current 45 char./sec printer, according to a spokesman. The print speeds on the latest MDS offerings are based on the number of characters printed on each line, as opposed to the number of print positions, he said.

The availabilty of a magnetic tape drive for the system provides Series 21 users with a means of converting diskette records to a CPU-compatible magnetic tape. Auxiliary storage is also provided, the MDS spokesman said.

The MDS-compatible channel allows Series 21 systems to interface directly with larger MDS 1200, 2300 and 2400 systems. This gives users expanded capabilities and the necessary elements for a distributed processing network, he claimed.

The printers range in price from $155/mo for Model 2142-1 and $220/mo for a Model 2142-2 to $440/mo for Model 2145. The Model 2481 tape drive with controller rents for $154/mo; the Model 2482 rents for $212/mo. The MDS-compatible channel costs $18/mo.

All prices are based on a three-year rental contract excluding maintenance, the spokesman noted from 1599 Littleton Road, Parsippany, N.J. 07054.

Tag-Processing Operation Helps Provide Timely Fashion Reports

DALLAS — Neiman-Marcus, known for a unique Christmas catalog and its reputation as a prestigious specialty store, recently implemented a comprehensive merchandising system.

The Fashion Merchandising Management (Famm) system provides fashion-merchandise decision makers at all eight Neiman-Marcus stores with timely information, a spokesman said. Reports provide complete stock status, sales and inventory information by class, style, vendor and other categories.

The majority of information required to produce Famm reports originates in the selling department. Buyers provide the remainder of information required for Famm reports when writing purchase orders and completing price change worksheets.

"There are basically two types of information originating in the selling department — Dennison Corp. merchandise tags and hand-written media," according to Larry Arcury, DP operations manager. All items classified as fashion merchandise have multipart Dennison tags. A tag is detached for each item received into the department, sold to a customer or returned by a customer.

Each type of tag has its own transaction code and need not be kept separate. Tags are spindled in each department and forwarded to Neiman-Marcus' DP center here at the close of each business day.

Rejects Processed

The tags are scanned on a Cummins-Allison Corp. Keyscan system the following day. Data read from the tags is stored on disk. Tags with unreadable characters are rejected into a separate stacker.

An operator processes the rejects at one of Keyscan's CRT/keystations by entering the unscannable characters only. Mutilated tags and handwritten media representing miscellaneous transactions are also key-entered via a CRT/keystation.

Data is transferred from disk to magnetic tape at the end of each day. The data is then transmitted to an IBM 370/158 at the corporate data center in California. Famm processing is completed overnight and reports are generated on a remote printer here.

The Famm system was implemented gradually by Neiman-Marcus beginning in the spring of 1976. "Prior to converting to the new system, we had been using a Cummins-Allison scanner interfaced to an IBM card punch," Arcury said. "While that system worked well for us, we foresaw a change in our requirements in the not-too-distant future that would require us to develop a system with greater efficiency and the ability to process increased volume."

A Cummins-Allison Keyscan system was selected for two basic reasons, he said. First, Neiman-Marcus was familiar with Cummins-Allison equipment since it was part of the existing system.

Secondly, Arcury said, Keyscan provided the speed to process substantially higher volumes and the flexibility to process transactions from both the existing system and the Famm system on an intermixed basis.

"We began our conversion process in May 1976," he recalled. "That process involved eight stores — two here and other stores in Fort Worth, Houston, Atlanta, Bal Harbor, Fla., St. Louis and Northbrook, Ill."

The conversion was completed in November, and it involved 78 departments and more than 1.5 million items. "We beat our timetable for the conversion by nearly six months," Arcury said.

The system includes a 64K-byte processor; a 2.45M-byte disk drive; a 9-channel, 800 bit/in. tape drive; two CRT/keystations; and a tag scanner.

"The system has worked exceptionally well for us," Arcury said. "Our volume has increased by 5%, but we achieve our desired turnaround time and we have only one person working the Keyscan system where our former system required a full-time staff of two.

"In addition, our downtime is less than 2%, and that's a critical factor since our tag-processing volume has increased substantially."

Ticket testing procedures are an important part of the Famm system. Test tickets are produced twice daily on each of the Dennison print/punch machines. These tickets are scanned on the Keyscan to verify accuracy and detect improper punching.

This process immediately identifies problems in the tag-printing operation and assures that accurate, scannable tags are affixed to all merchandise, Arcury explained.

Bits & Pieces

Forms Burster Boasts Unattended Operation

DAYTON, Ohio — The Standard Register Co. has introduced the Packmaster, a self-powered, relatively high capacity forms stacker. The unit is designed to be part of Standards' Series 1500 forms bursters.

The Packmaster, when used with a Series 1500 burster, permits unattended operation with automatic shut off and preselected forms pack heights up to 15 in., according to a spokesman.

The unit will accommodate one- or two-wide documents in lengths from 3- to 14 in. and widths between 4-1/4- and 19-1/4 in.

The unit sells for $1,310 for factory installation, with field installation costing an additional $96. Standard can be reached at P.O. Box 1167, Dayton, Ohio 45401.

Plotter Controller Bows

HOUSTON — Logic Sciences, Inc. has introduced the MPC-11, a microprocessor-based plotter controller that reportedly allows users to off-load plotter software from host systems.

The unit costs $3,500 with quantity and OEM pricing available from the firm at Suite 412, 6440 Hillcroft, Houston, Texas 77081.

Unit Tests 2314 Types

FULLERTON, Calif. — A device that provides disk pack and disk drive testing on IBM 2314-type disk drives is available from Wilson Laboratories, Inc.

Functions include restore, switch seek, seek incrementing, decrement seek and random patterns of incrementing, according to a spokesman.

The DX-2314 is equipped with 16 bits of error counting with overflow and has a stop-on-error control. The unit sells for $1,995 from the firm at 2536 E. Fender Ave., Fullerton, Calif. 92631.

Tape-to-Print System Offered

MELBOURNE, Fla. — Documation, Inc., said it is offering higher levels of off-line impact printing capability with its DOC-TPS tape-to-print system.

Up to four of Documation's line printers can be configured into a system to provide print speeds ranging from 1,250- to 9,000 line/min on a single system. The DOC-TPS operates with one to four industry-compatible tape drives with one central controller, according to a Documation spokesman.

Features of the system include IBM, Burroughs and Honeywell tape compatibility, top-of-form restart and form and line count for job-accounting records.

Twelve different configurations are available with lease rates ranging from approximately $2,600- to $9,573/mo. Documation can be reached at P.O. Box 1240, Melbourne, Fla. 32901.

Merged Technologies — Part 2

Three Alternatives Join COM, On-Line System

By William J. McCullough
Special to CW

There are a variety of alternatives for using computer output microfilm (COM) and on-line systems in conjunction with one another to meet the requirements of a given information system. The best way to determine which alternative to use is to clearly define the requirements of the system and what your organization is willing to pay for it.

The first alternative would be to maintain on-line only the most current or critical information from a data base and put the entire data base on a COM file. Defining current or critical data is a management decision and is dependent on the requirements of the particular system.

An index to all items in the data base would be maintained on-line for rapid access to detail information in the COM file.

This is the second article in a three-part series that looks at the integration of on-line and COM systems by William McCullough, national sales manager for U.S. Datacorp, a COM service organization.

The advantages to this alternative are as follows:

- The COM file would provide backup to the on-line system in the event of computer failure.
- The on-line update capability is maintained.
- The amount of mass storage required for the data base could be reduced substantially, thereby reducing costs.
- Index sequential software, if used for creating the COM file and index, could provide an audit trail on all file activity.

A possible disadvantage to this alternative might be that file inquiry could require two steps.

The next alternative would be to put the entire data base on COM and maintain only the index to the COM file on-line. Retaining the on-line update capability may be a requirement of the system.

The COM file and index could be updated on a daily basis provided you were using a COM service bureau that could provide overnight turnaround or had an in-house COM system.

The advantages of this alternative are the same as those outlined previously, with the added savings in mass storage space.

A third alternative takes us back to the initial planning for the system. After the requirements of the system have been defined and weighed against the cost of an on-line system, does the date base have to be on-line at all?

If the system does not require an on-line update capability, could a current COM system meet the retrieval and display requirements of the proposed system?

If it could, then the third alternative would be a COM system with daily updates.

The primary advantage of a COM-only system would be a dramatic reduction in the time and funds required to implement the system. If the data base already exists, the COM software could be implemented in less than a month, in most cases.

The disadvantage to this alternative would be the absence of an on-line file update at the point of need.

When we discuss distribution relative to on-line systems, we could be talking about one of two things — first, the actual transmission of data to the requesting terminal(s); second, a possible hard-copy follow-up sent via normal channels, e.g. mail, messenger or transmission.

Remote batch work falls into the latter category, even though it is the primary output, simply because it typically means paper, even though it is dependent upon transmission.

Let's look at them one at a time from a pro and con viewpoint.

Data transmission is such an integral part of so many businesses that they would be lost without it. The speed with which these systems function usually pleases us, as customers, very much.

How do you argue with a computer that is hundreds or thousands of miles away? You don't. But if you could see the files being referenced, you could tolerate the waiting time.

How about the paper output of on-line systems? Is it really cost-effective to use a remote batch terminal to print reports which must then go the traditional route of reproduction and distribution? Or to supply hard copies of the data in the on-line files for those "down" times?

The answer to both questions is "certainly not," especially if you were to compute the cost per character to deliver the data to the end user. It is this facet of on-line systems that makes systems analysts look for alternative methods of information dissemination.

Used in conjunction with an on-line system, COM can play a significant role in the distribution of information.

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Mini Duet Solves Order Entry Problem

By Ann Dooley
CW Staff

SANFORD, Fla. — Harcar, a manufacturer of aluminum windows, doors, bathroom enclosures and related products here, has solved a complicated order entry, inventory and production problem by using two minicomputers.

The system, called Matrix IV, was designed by Technology Applications Laboratory (TAL) of Satellite Beach, Fla. With the two Hewlett-Packard 21MX minicomputers, Harcar can simultaneously enter a customer's order into the data base to all the business functions without reentry, according to an HP spokesman.

Other manufacturers said such a system would require a minimum of 10 disks, but the work is being done on two, according to Carl Schilke, president of Harcar. They also said that even if it were possible, it couldn't be fully functional for nearly two years, Schilke added.

"In fact, the system is simplicity itself. Our employees are having no problems providing us with a tremendous amount of useful, detailed information," he said.

The other manufacturers also wanted to sell Harcar only packaged programs because customized programs would be too expensive. But "TAL was able to design programs for us exclusively," he said.

Previously, everything was handled manually or with the help of a calculator. In the last year and a half, however, Harcar's daily invoice mailing went from 40 to 200 and sales were expected to increase by $1 million each year for the next three years.

"I don't think we could have accommodated this kind of expansion without this system," Schilke said. "I think the paperwork would have been impossible for us to handle manually."

Harcar provides more than 50,000 options from six basic production lines with 168 standard sizes in each line. Component parts are cut from aluminum extrusions 18 to 24 feet long in mill and anodized and bronze finish.

As an order comes in, the customer's identification number is entered and an order form is displayed on a CRT showing any special shipping instructions, the customer's credit rating, the county where he is located and the Harcar salesman in charge of the account.

The shipping dates and products ordered by their parts number are filled in by an operator. A delivery date is assigned and a delivery ticket is printed; the ticket is sent to the shipping department until the order is ready to be shipped.

All the orders of similar products scheduled for the same shipping date are pulled from the data base by the computer operator at one time in order to produce the products. In other words, the system groups all bronze windows of a certain size together, Schilke explained.

This list is checked against the finished products inventory and the system determines what products need to be manufactured. The minicomputer then goes on to break down these items into their raw material components.

The computer is also programmed to pick out the most advantageous length of extrusion and size of glass for cutting. If the best

(Continued on Page 28)

The Turnkey — Part 3

Bottom Line: A Working System

By Vincent Deschamps
Special to CW

A proper implementation procedure will ensure a successful turnkey minicomputer system. Bear in mind the bottom line is that the system should work.

The vendor should be paid if the system works, but not until he can prove it will work.

A good deal on the wrong system is not a good deal.

Keep your system simple. Don't start with a system that is over-engineered or provides more power or capabilities that you may require in the next five years.

Base your decision on what you *want* the system to immediately do; what you *really need* the system to immediately do; and what you want your system to be able to do in three months, six months, one year and two years after installation.

The following are some recommended implementation procedures for turnkey systems to be stipulated by contract:

• Require a "no-obligation," preliminary sales proposal from the vendor.

• Based on the proposed system configuration of hardware and software, a deposit of more than 10% of the hardware and 40% of the software costs would be appropriate. The deposit should be returnable.

• Upon receipt of your deposit, obtain a commitment from the vendor to have one of his system analysts visit your offices to generate a *detailed* system definition. Allow 30 to 90 days for this analysis to be performed.

• Upon completion of the above analysis, a detailed system definition should be presented for your approval. If you do not approve it, your deposit must be returned and you should not be under further obligation to all vendors and lessors.

If you do approve the detailed systems definition, the vendor should begin programming the system and provide benchmarks and a timetable before the start of programming.

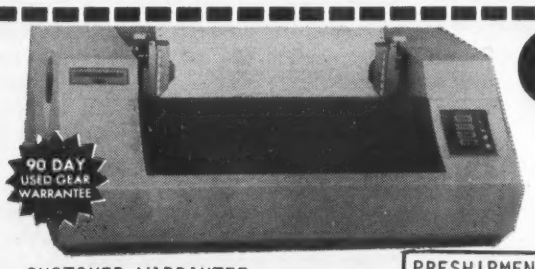
• Once the applications programs are completed, insist upon a systems test at the vendor's facilities, using sample test data

(Continued on Page 28)

Implementation Schedule

Function	Responsibility	Date
1. Financial & Technical Review	Hardware and Software	On Contract
2. Sales Agreement Signed	Customer	On Contract
3. A Deposit Check	Customer	Contract + 14 Days
4. Schedule Planning Meeting	Vendor and Customer	Contract + 60 Days
5. Detail the Specifications	Vendor and Customer	Contract + 75 Days
6. Prepare the Specifications	Vendor	Contract + 90 Days
7. Specification Approval	Customer	Contract + 180 Days
8. Write Application Programs	Vendor	Contract + 180 Days
9. System Demonstration at Vendor	Vendor and Customer	Contract + 180 Days
10. Application Program Acceptance	Customer	Contract + 225 Days
11. Operator Instruction and Documentation Preparation	Vendor	Contract + 225 Days
12. Delivery of Hardware	Vendor	Contract + 230 Days
13. System Installation & Diagnostic Test at Customer Site	Vendor and Customer	Contract + 230 Days
14. System Acceptance and Payment	Customer	Contract + 180 Through
15. Preparation of Customer Data	Customer	225 Days
16. System Processing.	Customer	Contract + 230 or More Days

This timetable represents a viable schedule of performance by the vendor which the user can insist that he accept as a condition of the sale. Remember, however, that some slippage may occur because of the availability of the time by the user to work with the vendor.



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Outcome of Implementation a Working System

(Continued from Page 27)

supplied by you. This test will ensure that the system complies with the specifications that were agreed upon by you and the vendor prior to the programming phase.

• When you have accepted this test, the vendor should prepare operator instructions and documentation for your system. Give him 30 to 45 days to complete this phase. Once they are completed, the vendor should be ready to deliver your hardware.

• The hardware will be installed by maintenance personnel who should also perform diagnostic tests. The latter is a requirement to assure the hardware is functioning properly. Upon completion of the diagnostic tests and your acceptance, you should pay for the system. The vendor should then assist you in the conversion of your existing system or procedures to the newly installed system.

• During the programming stage, forms should be created to be used for preparation of your data as it needs to be converted from your present system to your new system.

An independent source of your choice may be used to convert this information to punched cards or magnetic tape. Either of these media can be loaded onto the system after delivery.

Leasing and Financial Services

While minicomputer systems invariably carry a lower price tag than larger or standard (e.g. IBM 360 series) systems, you should examine the advantages or disadvantages of purchase, lease, rental, financing or other payment plans.

Many minicomputer systems manufacturers do not offer a real leasing plan. As a result, the customer has to find a financing resource which may be a third-party leasing organization, a bank, etc.

There are three basic types of leasing which are available from a few vendors or distributors (most minicomputers usually fall into the first category):

• Financial leasing with full payout over three, four or five years.

• Operating leasing with less than full payment over 24 to 36 months.

• Tax-oriented leasing with effective interest cost. This is usually the best, if large dollars are involved, because it provides leverage for tax purposes and a lower interest rate to the user.

Leasing a system has numerous advantages over purchasing. Leasing does not impact existing bank credit lines and preserves cash because the money to buy is not needed out front.

A leased system can be represented on the balance sheet as a direct expense as opposed to a depreciable asset, which takes seven years to write off. Because the rate of interest a leasee pays remains constant, leasing can be viewed as a hedge against inflation.

Most manufacturers and their distributors provide their own full field service and maintenance contracts. In fact, they usually insist upon having their leased or rented equipment serviced only by their own organization.

Some manufacturers or distributors that have user installations at inconvenient or expensive-to-reach locations either arrange third-party field service or, because of the relative inaccessibility of the site, have to charge more.

This is the final article in a three-part series. Deschamps is president of Turnkey Sales and Leasing, Inc. in New York.

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Mini Duo Solves Entry Problem

(Continued from Page 27)

size is unavailable, the next best is selected automatically.

Information about the excess material is stored, ready to be retreived the first time it can be used to fill an order, according to Schilke.

"This gives us tremendous raw material control," he noted. "We're able to locate the best available material quickly and use it with a minimum of waste."

After completing a production run, the system produces an efficiency report indicating the goods produced against the amount of labor required to produce them. In addition, it shows the exact costs of filling each order.

When an order is ready to be shipped, the operator calls the order form up on the CRT screen. If a back order is being filled, the operator fills in the quantity to be shipped and a back order report is prepared to indicate a completed order.

The Matrix IV system also produces management reports including a work order report listing orders by customer and showing daily receipt of new business; buy-out reports listing items on work orders which are nonstandard and need to be purchased; reports listing sales by salesman, county, state, customer and product; and a report listing the average discount given by product and salesman.

"With the two processors, we are achieving the kind of production and inventory control that major corporations have on a larger scale. And we are doing it with three employees who had never seen a computer in their lives until we got this system," Schilke said.

The second computer was added only recently because "we were having a problem scheduling different application work that needed to be done at the same time," according to Nina Pyle, Harcar DP manager.

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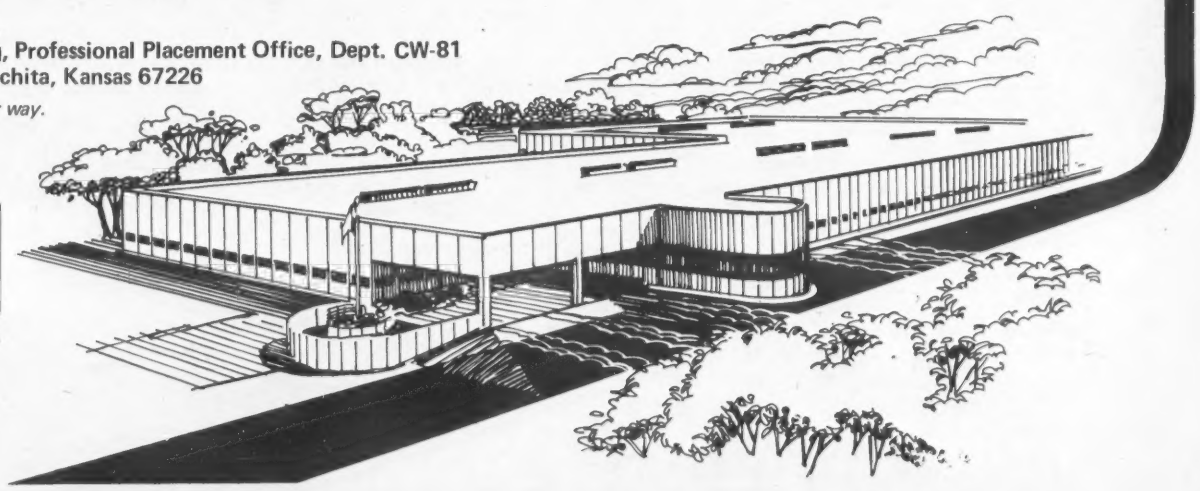

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DL11 Replacement Offered

CANTON, Mass. — An asynchronous single-line interface series that replaces the Digital Equipment Corp. PDP-11 system's DL11 interface has been introduced by Gen/-Comp, Inc. here.

The series 2031 asynchronous line interface allows users to interface a CRT or Teletype at transmission rates from 75- to 9,600 bit/sec using a single interface card, the firm said.

The interfaces are software- and hardware-compatible with the PDP-11, the company claimed.

The 2031-01 costs $525 and the 2031-02 costs $575 from Gen/Com at 6 Algonquin Road, Canton, Mass. 02021.

MPI Floppy Disk Drive Has Band-Driven Design

SEPULVEDA, Calif. — Micro Peripherals, Inc.'s (MPI) B82 floppy disk drive uses a band-driven design concept similar to that used by IBM for its drives, according to the vendor.

The B82 was designed for both mini- and microcomputer applications and uses standard 8-in. diskettes.

The drive offers up to 6.4M bits per disk for a single-density drive and up to 12.8M bits per disk for a double-density drive. Total storage capacity is 1.6M bytes on a diskette.

The unit's average access time is 91 msec and track-to-track access is 3 msec. Data is transferred at 250 kbit/-sec for single density and 500 kbit/sec for double density, according to MPI.

Both hard- and soft-sector format operation is accommodated. The drive will read or write an IBM-compatible floppy with the appropriate format, the vendor said.

The B82 costs $450; quantity discounts are available, MPI noted from 8724 Woodley, Sepulveda, Calif. 91343.

Aviv Designs PDP-11 Tape Controller

BEDFORD, Mass. — Aviv Corp.'s Model TFC 802 embedded magnetic tape controller is said to be compatible with all Digital Equipment Corp. PDP-11 minicomputers.

The unit offers both NRZI and/or phase-encoded recording techniques for standard tape drives over a speed range of 12.5- through 125 in./sec, a spokesman said.

The package consists of three boards in a system unit with interconnecting cables to the PDP-11's Unibus and the tape drive. These units are compatible with DEC's RSX-11, RT-11 and disk operating systems, the firm added.

Complete diagnostic software which includes a subset of DEC diagnostics DZTMA Revision H, DZTMB, Revision B and DZTMG Revision C is supplied, the spokesman said.

The controller costs $3,600 from Aviv at 300 Sweetwater Ave., Bedford, Mass. 01730.

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The new Computerworld Index, published quarterly and cumulative, is an invaluable reference tool for organizations that have a need-to-know about what's going on in the computer world.

The first issue of the Index for example, covers the last six months of 1976, and it includes more than 4,000 entries by subject, author and name of any company mentioned. It breaks topics down into highly usable and convenient categories:

- There are entries by *product or service*, like *PRINTERS*, which has 37 entries in the six-month period covered; or *LEASING*, which has 10.
- There are entries by *industry*, like *INSURANCE*, under which there are 17 entries for various stories on the use of computers in the insurance industry.
- *Types of computer applications* is another way you can look something up in The Index. The category *INVENTORY SYSTEMS*, for example, has 21 entries.
- *Regulatory, security* and *social issues* are also indexed. There are 34 entries under *PRIVACY*, 10 under *PRIVACY ACT* and 9 under *PRIVACY PROTECTION COMMISSION*, for example.
- The Index also makes it easy to look into *legal aspects of computer use* with categories like *LITIGATION*, which has 24 entries in the last six months of 1976.
- Even *foreign countries* are indexed. The category *JAPAN*, for example, has 9 entries.
- . . . and there are *others: KIT COMPUTERS* (the kind you build yourself) are the latest thing, and The Index shows 5 entries. *POINT-OF-SALE SYSTEMS* has 14 entries . . . and there's much, much more.

Company Names, for example, are a very important part of The Index. Looking under IBM, we find *ten* categories:

- IBM GENERAL
- IBM HARDWARE
- IBM LITIGATION
- IBM PRICING
- IBM SOFTWARE
- IBM POLICY
- IBM SYSTEM 3
- IBM SERIES 1
- IBM SYSTEM 7
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HIS Ruggedizing Level 6 Machines

WALTHAM, Mass. — Honeywell Information Systems, Inc. has announced ruggedized versions of its Level 6 minicomputers.

Designed for special factory, environmental and military applications, the minis will be available in the third quarter. The systems can be configured with either core or MOS memory, a spokeswoman noted.

A ruggedized 250-byte diskette unit and 240 line/min and 600 line/min printers will also be available for the system; additional rugged peripherals are expected by 1978, HIS said.

A typical system with the 6/36 processor and 16K of MOS memory with error detection and correction costs about $25,000.

Peripherals for synchronous and asynchronous communications lines as well as CRT or teleprinter consoles and up to 64K words of memory will be available, the spokeswoman said from 200 Smith St., Waltham, Mass. 02154.

Bytronix Controllers Fit DG, DCC Minis

FULLERTON, Calif. — Bytronix Corp. is offering two disk controllers, each contained on a single circuit board, for Data General Corp. and Digital Computer Controls, Inc. (DCC) computers.

The Model B234 controller requires one slot of the computer chassis and is both software- and media-compatible with the DG 4234 disk system. It can control up to four drives.

The B234 does not require wire wrapping, use of the external I/O bus connector or an external adapter.

The Model B446 controller is software — media- and pin-compatible with the DCC 116446 disk system and can be interchanged with DCC 116446 controller boards in existing systems, Bytronix said. The B446 will control one or two drives.

The price of either controller is $2,600, Bytronix said from 2751 E. Chapman Ave., Fullerton, Calif. 92631.

WE INTERRUPT THIS PUBLICATION FOR AN IMPORTANT ANNOUNCEMENT.

TI's new 765

Until now, a portable data terminal operated on-line with its computer via a telephone line.

Now it can operate when you or your phone lines are busy.

Add bubble memory and a terminal can remember while it waits to talk to your computer. That's the beauty of the new *Silent 700** Model 765 Portable Memory Terminal.

You can enter sales and order information using the typewriter-like keyboard all day long.

And store it in the memory that's built right-into your portable unit.

Then you can edit when you have time. And transmit when on-line rates are lower.

Here's an example of how the 765 terminal means business:

A traveling salesman story.
A garment salesman in Atlanta wakes up to a long day that will take him to St. Louis calling on a handful of major department stores. Leaving the house, he grabs his samples and a small compact carrying case. Weighing just 17 pounds, the new Model 765 Portable Memory Terminal includes a keyboard with upper- and lower-case characters, a built-in calculator-style numeric cluster, a quiet 30-characters-per-second non-impact printer, and an accoustic coupler for telephone connection.

Texas Instruments is the first company to put bubble memory in a form you can get your hands on.

The *Silent 700* Model 765 Portable Memory Terminal.

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Taking to the air.
Minutes later he reaches the airport and boards his flight. His 765 terminal fits easily under his airline seat. With the revolutionary new dimension of bubble memory, he'll be able to enter and keep sales data without the added bulk and cost of cassette cartridges, floppy discs or paper tapes.

Third floor, sportswear.
Arriving at his first sales call, his memory terminal goes to work. Without connecting to a phone, he begins to enter his orders, prices and delivery commitments. He has at his fingertips a file management system and a powerful operator command mode that will let him easily select a communications mode, configure memory, and enter or edit his orders. And the story stays exciting to the close.

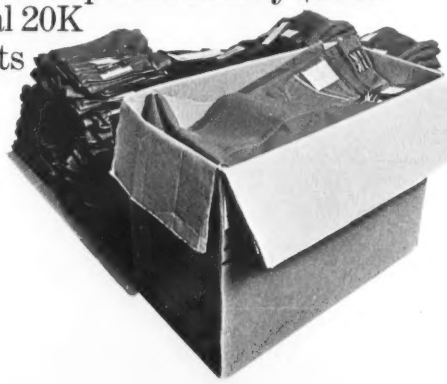
A last-minute change.
Later in his room, he reads back his sales entries, checks his inventory figures and edits a few changes on his hard copy record. Then he ponders the success and commissions of the day that have been stored up in the terminal's memory. The basic 765 terminal comes with 20K bytes of memory storage. And can be expanded to 80K bytes — the equivalent of 16 to 20 fully typed pages.

TEXAS INSTRUMENTS.

ns business.

Later that evening.
With his orders prepared and the phone rates down, he dials up his central computer at his warehouse. The stored data is transmitted at 30 characters per second. And his sales are rung up. Saving time. And saving money.

Small price for remembering.
TI's new 765 is priced at only $2995†. Additional 20K increments of bubble memory storage are $500 each. And, of course, quantity discounts and lease programs are also available.



Wrapping up the deal.
The next day, his customer's orders have been processed. And his first deliveries have been packaged for shipment.

TI's new 765 Terminal with bubble memory has sold a good salesman.

Ask TI how the new memory terminal can help your business. Return this coupon today for more information. Or call Terminals and Peripherals Marketing at (713) 494-5115, extension 3286.

Computerworld

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Print. *Allows the user to initiate and terminate printing of text.*

Insert. *Allows the user to insert additional characters into the text being edited.*

Delete Character. *Deletes characters where desired.*

Delete Line. *Allows the user to delete multiple lines of text where desired.*

Stop. *Allows the user to terminate editing mode.*

Top. *Allows the user to set record reference to beginning of file.*

Bubble Memory...New Technology for Mass Storage
Contained in a small module, bubble memory is an electronic chip that stores digital information by changing the magnetic polarity of tiny areas in the chip called bubbles. The tiny bubbles are actually cylindrical magnetic islands polarized in a direction opposite from that of a film in which the bubbles function. The memory has no moving parts, and because it works magnetically, it retains information even when the power is turned off, a quality particularly important for portable equipment.

Bubble memory has advantages over electro-mechanical mass memory devices such as paper tape, cassettes or floppy discs. This new technology offers solid state reliability, higher access speeds, smaller size, and less weight and power consumption.

The 765 terminal can access any indexed record in memory in less than 15 milliseconds, compared to a search time from several seconds to several minutes for a cassette system. If the data location in the 765 memory is not known (not indexed), the character string search speed is 1000 characters per second, about four times the speed of a cassette search. Compared to a floppy disc, the bubble memory indexed record access time is more than ten times faster, but total data transfer rates are lower.

Also available in Model 763 Memory Terminal.
The 763 terminal, a stationary version of the 765, is available for applications requiring non-volatile memory and text-editing capabilities. The 763 is equipped with TTY or EIA interfaces for external communications. At under 16 pounds, the 763 is a compact unit

TI's Model 763 Terminal

appropriate for use in any fixed location.

At $2695†— quantity one price — the 763 terminal is another price performance leader from TI.

Nationwide Sales and Service
Wherever the Models 763 and 765 Memory Terminals are used, the Texas Instruments nationwide network of factory-trained sales and service personnel is available for support. Sales and service offices are located throughout the United States as well as Canada and major countries overseas.

†U.S. Domestic Price.

TEXAS INSTRUMENTS
INCORPORATED

Welcome to Our New World

With this issue, *Computerworld* is starting a new section: Microcomputing.

This weekly feature will cover the latest developments in micro products and software as well as application stories on how hobbyists and others are using the new devices.

Although primarily aimed at the recreational computing market, the section will also cover some business uses of the new devices — particularly where businesses are using off-the-shelf, kit-type computers.

The advent of the microprocessor is changing the face of the computer community, broadening it and making computer power accessible to more people than ever before.

This is happening in two ways. First, microprocessors are being incorporated into more and more products offered to large computer users. These developments will continue to be covered in the other sections of *Computerworld*.

But along with that revolution there is another: Micros are increasingly being used by people in their homes, for enjoyment, not necessarily for business.

The developments in the field are coming fast and furious — yesterday's price breakthrough is old hat today. Hobbyists need up-to-date information on all the latest products, both in the hardware and the software areas.

That's what Microcomputing is all about.

As a weekly news publication, *Computerworld* can provide the timely information needed in such a fast-changing area — new micro hardware and software will be covered here first, just as new products in the other areas of the computer world are covered first.

But along with the latest product information, Microcomputing will also cover applications of the new devices, both for personal and business use.

And that's where you come in. *Computerworld* is interested in reader experiences with microcomputers — either innovative uses or just better ways to program and use some of the standby applications.

So if you're using micros to educate your children — or if they're using them to educate you; if you're using them to program your thermostat, balance your checkbook or just play Star Trek, let us know.

We're interested in all user experiences.

Not for Indexing Recipes

Personal Computers Seen Luxury Only

By Ann Dooley
CW Staff

CAMBRIDGE, Mass. — Although some people are predicting personal computers will sweep the country, "the personal computer market is not the dawn of the computational era," according to William Grinker, executive vice-president of American Used Computer Corp.

Speaking before a group of MIT alumni here recently, Grinker contended personal computers "will never be a mass market success, but more of a luxury item."

Homeowners won't be using them for indexing recipes or other household chores; it's the professionals who will use them in their work, he said.

Grinker emphasized that personal computers are different from the game-playing hobby computers on the market. The hobby market is 10 times larger than the personal computing market, he said.

But cospeaker A.F. (Sonny) Monosson, president of American Used, disagreed, saying that "everyone will have [a personal computer] in their house whether they use it or not."

Monosson noted there is no one definition of a personal computer. In trying to find out what one is, Monosson told the audience, he had asked various people — and no two answers were the same.

The only answer is that whatever computer a person uses is his personal computer, he said.

Most people over age 25 haven't gotten in on the personal computer craze anyhow, he said. They have their favorite standbyes which they use no matter what, he explained.

The personal computing craze began two years ago in California and the cult swept the East, Grinker said. A year ago, American Used opened The Computer Warehouse Store in Boston on a limited basis and has had to keep it open for longer and longer hours to meet the demand, he said.

The personal computing market transacted $1.2 billion dollars in business last year, Grinker stated. Although it might not be able to sustain such a pace, it has expanded rapidly, he said.

No one is sure where any growth will lead, he added. A Southern California Computer Society study found 85% of personal computer use is work-related, he pointed out.

The community from which the personal computer user is drawn consists of 1.5 million people, of which not more than 10% will be permanent users, he estimated. Most will dabble in it for a while, probably swept into the market from the "Christmas hype" that will be occuring this fall, he predicted.

User Profile

Personal computer users will usually be professionals in the computer field, according to Grinker. It is estimated that 400,000 DP professionals, mostly software-oriented types, help make up the market, he said.

Programmers want to own their own computer because they have no control over the computer at work: they can do whatever they want with their personal computer, Grinker said.

The second group of personal computer users is made up of students. It is estimated that as many as 500,000 high school students and college students will be users, Grinker said.

"The most intense hobbyists are not in college, but in high school," he added. "They're really frightening."

The third group in the personal computing market is the experimenters, according to Grinker. Numbering nearly 300,000, they are the ones who become involved on an intellectual level, he said.

And the fourth group includes about 300,000 ham operators, Grinker said.

Personal computer use won't be completely work-related, Grinker acknowledged. The computer could be programmed for several unusual applications, such as a cocktail party model to calculate how expensive the party would be depending on the kind an amount of liquor served.

Another application could include programming the computer to handle and expense account, entering the known expenses and having the computer fill in the rest.

Nothing has really changed in the hardware and software relationship in the last 20 years, Grinker continued. Computers are smaller, cheaper and faster, but they are still incomplete without the software to finish them off, he said.

Zilog Takes Modular Approach, Announces Family of Boards

CUPERTINO, Calif. — Zilog, Inc., has introduced a family of microcomputer boards to offer users a modular approach for building computing and processing systems.

Zilog's MCB series was designed around the firm's Z80 microprocessor unit (MPU) circuit and a single-chip NMOS silicon gate device with a clock rate of 2.5 MHz. Its 158-instruction set includes all of the 8080A and 8085 instructions, a spokesman claimed.

Each of the present boards is bus-compatible and directly interfaces with all other boards in the series, he noted.

Leading off the series is the Z80-MCB microcomputer board. Designed to operate as a single-board computer, it has self-contained memory plus serial and parallel I/O ports.

The Z80-MCB has a capacity of 4K bytes of dynamic random-access memory (RAM) as well as up to 4K bytes of programmable read-only memory (Prom), erasable Prom (Eprom) or masked read-only memory (ROM).

The Z80-MCB, which costs $495, can be expanded to include more I/O and memory by adding other boards in the series. A strapping option allows users to put 16K by 1-bit dynamic RAMs in place of the 4K by 1-bit RAMs, the spokesman said.

The Z80-MDC memory/disk controller board provides users with 12K bytes of dynamic RAM and a floppy disk controller capable of handling up to eight floppy disk drives.

The Z80-MDC has a strapping option for setting start addresses of each 4K-byte page. Sixteen-bit cyclic redundancy checking is also featured, according to the spokesman. The board sells for $795.

16K Bytes of RAM

The Z80-RMB memory board has 16K bytes of RAM and up to eight ROM or Prom chips per board. The strapping option allows memory to reside in any segment of the 64K address space. It costs $750.

Also in the family is the Z80-PMB Prom memory board, providing up to 32K bytes of ROM, Prom or Eprom. Jumper options allow each 16K bytes of memory to reside in any segment of the 64K address space.

The board costs $395, excluding the cost of the Prom chips.

Zilog is located at 10460 Bubb Road, Cupertino, Calif. 95014.

MICROCOMPUTING

Motorola Puts 8-Bit System Into Kit Form

TEMPE, Ariz. — Motorola Semiconductor Products, Inc. has introduced an 8-bit microcomputer system in kit form.

The Educator II contains an NMOS 8-bit M6800 microprocessor unit (MPU), peripheral interface adapter (PIA), 128 by 8-bit static random-access memory (RAM), two TTL 512 by 4-bit read-only memories (ROM) and a TTL clock circuit.

An executive program residing in the ROMs contains routines for examining and modifying memory locations and MPU registers, servicing interrupts, transferring programs to and from cassette tapes, searching tapes for specific programs and testing the finished kit, according to a spokesman.

The executive uses 14 bytes of RAM for a scratchpad; the remaining 114 bytes are available for user programs.

An optional 128 by 8-bit RAM can be added for larger user programs, the spokesman said, noting the kit contains all necessary parts, with the exception of a power supply, to bring the system "up and running."

Aluminum Case

Educator II is housed in an aluminum case. Front-panel toggle switches and LEDs are used to enter and display machine code.

Edge connectors on the printed circuit board provide an interface to the PIA and the address, data and control buses for system expansion.

Accessories planned for the Educator II include a video display kit, module card rack and power supply, memory modules and applications programs on cassettes, the spokesman said.

Educator II retails for $169.95. Additional 128 by 8-bit RAM costs $19.04 and a power supply kit is priced at $29.95 from the firm at 705 W. 22nd St., Tempe, Ariz. 85282.

For Southwest 6800

Dual Minifloppy Debuts

SAN ANTONIO, Texas — A dual minifloppy kit designed for its 6800 computer system has been introduced by Southwest Technical Products Corp.

The MF-68 minifloppy disk system includes all of the hardware and software needed to provide a complete dual-disk operating system, according to a spokesman. The system can be expanded to its four-drive limit with an MF-6X expansion kit.

The software provided with the MF-68 includes both disk Basic and a floppy disk operating system. The operating system commands for disk operation include CREATE, SAVE, RUN, LOAD, PURGE, PACK, CATALOGUE, RENAME, INITIALIZE and PATCH.

The MF-68 is offered in kit form only. It includes controller, chassis, cover, power supply, interconnecting cables, assembly instructions, two assembled Shugart minifloppy drives and a diskette with the operating system and disk basic.

The MF-6X expansion kit includes power supply, chassis, cover and two assembled minifloppy drives.

Prices of $995 for the MF-68 and $850 for the MF-6X include prepaid postage. Southwest is at 219 W. Rhapsody, San Antonio, Texas 78216.

Cramer Kit Bows

NEWTON, Mass. — Cramer Electronics, Inc. has introduced a single-chip 16-bit microcomputer kit that sells for less than $600. The kit includes a hardware multiply and divide capability, according to a spokesman.

The Texas Instruments 9900 Cramerkit features 16 1K by 1-bit static random-access memory chips, two 1K by 8-bit erasable programmable read-only memory (Eprom) chips, 128 bits of I/O and an on-board Eprom programmer.

The only two hardware items not included in the package, according to the spokesman, are the power supply and the panel board, which can be purchased separately if needed.

The kit sells for $595 from Cramer Electronics at 85 Wells Ave., Newton, Mass. 02159.

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Study Eyes Firmware Changes

Price/Performance Shift Seen Continuing

By Molly Upton
CW Staff

MENLO PARK, Calif. — Price/performance values of large IBM and plug-compatible mainframes will continue to shift throughout the rest of the 1970s, according to a report from Input, Inc., a research firm here.

The resultant values for users and changes in margins and products for manufacturers will have a variety of ramifications, according to Input's predictions.

IBM is likely to introduce more processors of the 3033 ilk, including those that can be tightly coupled; it will also continue to shift functions among hardware, firmware and software, which will make continued compatibility with IBM functions difficult for firms such as Amdahl Corp., Input stated.

"As a long-term strategy, Amdahl must at some time deviate from total compatibility with IBM. The economic impossibility of constantly reacting to all the hardware/-firmware/software tactical announcements from IBM in the large systems arena makes this strategy mandatory," the report contended.

Mass storage systems and communications processors appear to be the most promising areas for Amdahl to expand its product line prior to 1980, Input suggested, adding Fujitsu has product offerings here that would fulfill Amdahl's needs and also allow Fujitsu to achieve market goals in the U.S.

Future Offerings

Input projected IBM will introduce a 3031 and 3032 as well as a 3033 TC1 and 3033 TC2, which are tightly coupled alternatives of the 3033. Compared with the price/-performance of the 370/158-3, using its old price, these machines will offer price/-performance ratios of 2.7, 4.5, 6.5 and 7 respectively, Input said.

Amdahl needs a clear price/performance advantage over comparable IBM systems, Input said. The research firm suggested Amdahl could react to the coming 3032 announcement by adjusting the price of its 470V/6-II to that of the V/5 and lowering the V/5 price to about $2 million.

"This would result in a more reasonable price spread for the 470 line and establish clear price/performance advantages over the IBM line," the report indicated.

Amdahl has yet to respond adequately to the 370 Extended Facility, Input said, but observed "any deviation from compatibility will result in an adverse customer reaction out of all proportion to its true significance."

Along with the increased price/performance ratios of new IBM machines will come a drop in the residual value of current IBM processors, Input noted.

Input forecast the residual values of the 370/158 and 168 will stabilize in the 30% to 35% range near the end of 1978 and drop again early in 1980 because of a new processor family announcement by IBM.

By 1981, the 168's residual value will be about 10% of its 1976 value.

Itel Challenge

The most important challenge confronting Itel Corp. will be the "effective management of its inventory of IBM equipment," the report said. "This single issue will have the greatest impact on Itel's profitability — even more than any of its own products.

"Plug-compatible mainframe makers, like their peripheral supplier counterparts, are going to find out just how expensive it is to keep up with IBM," Input added.

As their profit margins become squeezed, they "must be able to retain IBM compatibility until they achieve a significant user base. This means they must be able to respond to the hardware/firmware/software announcements of IBM, particularly announcements such as the Extended Facility," the report continued.

Others Affected

But plug-compatible manufacturers are not the only ones affected. Although users of the other mainframers indicated they are content, "the price/performance pressure" exerted by the large systems at the top and by minis at the bottom "results in an unsatisfactory competitive situation for medium- and small-scale stand-alone systems," according to Input.

And minicomputer and terminal makers will have their problems maintaining compatibility as IBM moves to its System Network Architecture.

"All mainframe manufacturers will be affected by IBM's emerging hardware/-firmware/software strategy."

IBM Barriers Active and Passive, Economist Tells Antitrust Trial

By Catherine Arnst
CW Staff

NEW YORK — IBM has erected both active and passive entry barriers to prevent competition in the general-purpose and plug-compatible computer markets, according to Dr. Alan K. McAdams, the government's chief economic witness in the U.S. vs. IBM antitrust trial.

Passive barriers are those which already exist in a market when a competitor tries to enter it and are not directed at any one firm. Active barriers are those which "go beyond what is normally expected" by competitors and are directed specifically against a particular firm or market segment, McAdams explained at the trial recently.

Creating a leasing environment in the computer industry and bundling systems and services together are two types of passive barriers IBM has erected, the Cornell University economics professor testified.

The leasing environment provided IBM with the advantage of strict account control and the stability of recurring revenues, he said. However, it requires a new entrant to have large amounts of capital to compete effectively because profitability is deferred for years; this makes it difficult to attract investors, McAdams said.

This has never been a problem for IBM, whch generally has a large cash hoard and is considered an attractive investment by the financial community, he told the court.

By bundling the price of software, maintenance and support with the price of a computer system, IBM was also able to contain competition passively, McAdams said. This method also required new entrants to the market to have large amounts of capital, he added.

The requirement for plug compatibility offered a passive barrier to entry into the peripherals market, but numerous firms managed to enter in spite of that obstacle, McAdams testified. As a result, IBM adopted business strategies that created "very substantial active barriers," he said.

In 1970, when plug-compatible manufac-

(Continued on Page 40)

CI Notes

CSC Wins Dismissals In Separate Lawsuits

Federal district courts in California and New York have rendered judgments in favor of Computer Sciences Corp. (CSC) in two unrelated law suits. The law suits concerned a stockholders' class action and a charge of patent infringement.

In Los Angeles, the Federal District Court ruled CSC did not violate securities laws in connection with a 1970 earnings projection. A CSC stockholder had claimed the company issued a misleading earnings projection because of the subsequent discontinuance and write-down of its Computicket operations.

The suit, filed in 1970, sought damages of an unspecified amount on behalf of persons who had purchased CSC stock between Jan. 20 and April 3, 1970 and who held the stock beyond the April 3 date.

In the second case, the Federal Court for the Southern District of New York, in dismissing the complaint, ruled CSC's computer-based system for off-track betting in New York City did not infringe on a patent held by Electronic Assistance Corp.

This 1971 suit also sought damages of an unspecified amount. CSC ceased to operate its off-tracking betting system for the city in 1973.

Judge Nixes Univac Award

PHOENIX — A judge here has issued a permanent injunction barring the State of Arizona from awarding a state computer contract to Univac.

The suit arose after Honeywell Information Systems, Inc. contested the award on the basis that its response to the state's request for proposals (RFP) for a system was priced lower [CW, July 25].

HIS 66/85 Deliveries Snagged

MINNEAPOLIS — Honeywell Information Systems, Inc. has announced a delay in initial deliveries of its Model 66/85 large-scale computer because of technical production problems.

The problem is in the new packaging technology of integrated circuits which HIS is planning to use in the system. No details were available.

No new delivery date has been set. HIS does not want to commit itself to a date because it wants to test the entire system again after the packaging problem is solved.

Decision Data Readying Moves With System 4

By Esther Surden
CW Staff

HORSHAM, Pa. — Univac's BC-7 system originated in the back room of a small company here, according to Louis H. Benzing, president of Decision Data Computer Corp.

As Benzing tells it, Univac contacted Decision Data in 1974 about developing a small business system. The firms started a joint venture in which a lot of Decision Data's people joined a special program dubbed Project Acorn.

The project continued until last summer, Benzing said, when Decision Data had some financial difficulties. Under an agreement reached with Univac, the Decision Data people from the project were transferred to the Univac payroll.

But Decision Data retains rights to the device which eventually became the BC-7 and can market it in any way it sees fit.

"We will probably take the product (called System 4) off into a different direction," Benzing noted. "Decision Data is moving very cautiously in this market."

At last count there were 90 companies offering a small business system; and it's obvious that given the choice between Decision Data, a small firm, and Univac, a large company, the user will choose Univac unless Decision Data can offer something that Univac can not, Benzing said.

"We are going to seek out a niche in the market that the big boys are not addressing," he stated.

The firm isn't putting all of its eggs in the small systems basket, however. Its primary business is in the IBM "aftermarket" — that is, the firm provides cheaper or better products than IBM to IBM customers, he claimed.

The company started out in 1969 to provide enhanced card punches and reader equipment for the IBM System 3. Several years later, it became obvious that the same product could be applied to 80-column cards.

The 96-column card readers and punches led to several OEM contracts, including a large one from Burroughs. When IBM decided not to pursue the 96-column card, however, the rest of the industry followed suit, leading to Decision Data's financial problems, he said.

"IBM seldom does anything by mistake," marketing manager Richard L. Schwab added.

In 1975, Decision Data introduced a line of System 3 printers and Mosfet memory and in 1976 followed with 360/370 printers. The company plans to build on its own user base when it begins to market its mini system.

"Key-to-disk is one possibility" in which the firm could sell either directly to its own end users or to OEMs who could add value, Schwab said.

Another option the firm may take with the System 4 is to keep it both batch and interactive because there is a "tremendous installed base that still wants to use cards," he said. With about 6,000 customers, "we are also one of the few companies that is out there in that user base already."

The market the firm serves is very price/performance-oriented, Schwab added. "The users will get interested if you can save them a few dollars; most will be interested if you can prove they won't have a problem with the product; and all are really looking at the performance, the product must increase the total throughput of the system," he said.

Witness Details Market Barriers

(Continued from Page 39)

turers (PCM) were considered viable competitors, IBM established the Cooley task force, which recommended that IBM explore ways of interlocking IBM peripherals to IBM systems through software and system architecture. It also suggested IBM develop peripheral rental and purchase pricing plans that would be competitive and consistent with IBM's product strategy of technical escalation, according to the government's pretrial brief.

Thus, the Cooley task force designed many of the active barriers IBM instituted in this market, McAdams said.

Changing the interface design was one of the active barriers often employed by IBM in the disk and tape drive markets, McAdams said. By changing the interface, IBM forced a competitor to redesign its entire product to ensure it would successfully plug into an IBM CPU.

In the disk drive market, IBM introduced the 2319A disk drive for attachment to the 370/145 to stop further encroachment on its 2314 disk drive base, McAdams said.

IBM's Fixed-Term Plan (FTP) is yet another example of an active barrier to entry, McAdams said. The FTP, instituted in May 1971, offered low rental prices to users who signed long-term leases but it penalized those who canceled before the lease termination date with large termination charges.

The FTP was only available to users for tape drives, disk drives and printers — all products on which IBM met competition. It locked users into IBM products for the length of the lease, effectively protecting those markets from competitive encroachment, he said.

Also, at the end of the two-year plan, most users exercised the purchase option available, he added.

When less computer equals more performance, small really is beautiful.

A special report on *Minicomputers and Small Systems* in the August 29th *Computerworld*.

Minis are now functioning at every level of business and industry, and *Computerworld's* August 29th special report, edited by Esther Surden, will focus on several issues that are currently the subject of widespread discussion and debate in the minicomputer field. We'll also cover minicomputer hardware in depth — including microcomputers being used in data processing systems. In all, you'll see a variety of applications stories and tutorials on topics like these:

- Programming languages for small business systems — commentary on languages that have the same name but because of the "improvements" added by competing vendors, may have wide variances in operating efficiency.
- How to evaluate technical evaluations — a look at what benchmark tests and product specifications mean.
- The evaluation and selection process — a case study.
- Minicomputer maintenance — analysis of possible methods (vendor maintenance, independent service organizations, and end user self-support) with an eye to cost savings.
- Minicomputers in distributed processing — stand alone and communicating.
- Using minicomputer equipment — including general purpose minis, small business systems, turnkey systems, miniperipherals and microcomputers.

If you're interested in finding new ways to make data processing more useful and cost effective throughout your organization, you should read our special report in our August 29th issue And if you're a mini manufacturer, OEM or systems house who's interested in telling potential customers how your equipment can help them in their jobs — advertise here. Your *Computerworld* salesman can give you complete details. But don't miss the August 12th ad closing date. Call Terry Williams at (617) 965-5800 to reserve space for your ad.

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Time Needed to Build Supply

Delay on DAA Registration Seen Fortunate

By John P. Hebert
CW Staff

NEWTON, Mass. — Telecommunications users connecting equipment to the public telephone network would have had a long wait for Data Access Arrangements (DAA) if manufacturers of the devices hadn't won a delay from the Federal Communications Commission (FCC) in late May, according to officials from Elgin Electronics, Inc. of Waterford, Pa.

The FCC's mandatory registration ruling otherwise would have gone into effect on June 1 as scheduled, E. Joseph Seppala, Elgin's marketing manager of telecommunications products, said at a recent press conference here.

The resulting demand for FCC-certified DAAs would have outpaced their supply, Seppala said.

The DAA, or data coupler, interface provides the means of connecting customer-provided equipment with switched telecommunications networks without electrical harm, Seppala explained.

Even though farsighted individuals could have — after the Carterfone Decision in 1968 — predicted registered DAAs would someday become a reality, neither users nor independent DAA manufacturers were prepared for the FCC's mandatory registration process, Seppala indicated.

Fortunately for users and vendors alike, the FCC extended its ruling's full implementation until Jan. 1, 1978.

Not Prepared

The independent manufacturers of DAAs — and users — didn't take the FCC's registration program seriously even by the fall of 1976, although the commission originally intended to implement the registration program the previous spring, Seppala said.

AT&T obtained a court stay delaying the program from the originally scheduled implementation date of April 1, 1976 until January of this year, when it again asked the courts to delay the program until June 1.

But before that implementation target date, DAA manufacturers realized they were unable to fill all of the orders for the protective devices. The vendors asked the FCC to extend the registration date until Jan. 1, 1978, Seppala explained.

When that date finally arrives, barring additional unforeseen delays, AT&T's Western Electric manufacturing subsidiary will probably stop making DAAs because it said it will not be financially practical to register and supply tariffed devices to users, Jack Van Arsdell, vice-president of marketing at Elgin, said.

Even now, users are telling the telephone company to take their DAAs out and telling independent vendors to install their registered units, Seppala said, adding Western Electric's warehouse is becoming overstocked with unregistered data couplers.

But the independent vendors can't keep up with user demand, according to Seppala. "In September or October, manufacturers will be in a better position to supply the equipment," he said.

The reason for this delay, according to Harry A. Montgomery, Elgin vice-president of engineering, is the many steps associated with the FCC registration procedure.

First, a vendor's design engineers must be familiar with Part 68 of the FCC rules. If they aren't, Montgomery said, the company will have trouble registering the equipment.

Secondly, many test steps are required to ensure the unit's protective function. A company can easily spend 80 hours testing each class of unit, which adds up to a substantial investment, Montgomery said.

Once the factory has performed the tests, the test data must be put on paper — the equivalent of another 40 hours, he said.

Then, when the forms are submitted to the FCC with product photos and wiring schematics, they go to the bottom of the pile. Once reviewed, the documentation must be placed in the *Federal Register* to allow for public comments.

A DAA manufacturer must reply to each comment and to each reply. "Then the FCC is satisfied," Montgomery said.

What is the time for that registration procedure? Elgin, for example, applied for the FCC stamp of approval last November and early this month the product was still not registered.

But the result of these involved procedures will benefit users, who should see a drop in today's price of between $100 and $150 to a figure well under $100 in the near future, Seppala added.

In the future, modem manufacturers may follow the example of Vadic Corp., which brought out the first FCC-registered modem [CW, April 4]; according to Seppala.

Other manufacturers will probably register modems with discrete, integrated DAAs to offer users a device compatible with the switched network and prevent other vendors from inspecting the circuitry, he said.

Israeli Bank Going IBM

By Aaron Sittner
Special to CW

JERUSALEM — The Bank of Israel plans to acquire its own IBM 370/158 system and discontinue subscribing to the services of the "Office Mechanization Center," the Israeli government's central DP unit.

The central bank's director of data operations, Joseph Sarig, said the IBM installation with ancillary equipment would be leased for $1.26 million per year.

The decision to lease the 370/158 followed a recommendation by a three-man committee of bank executives, but without issuance of a public tender, as is customary for acquisition of costly apparatus.

Trade circles report that Burroughs, NCR and Control Data Corp. agents in Israel will protest the skipping of an open tender by the Bank of Israel. They say the decision was "arbitrary and will only reinforce IBM's monopoly on DP operations in Israel."

Want Unbundled Software

Japanese Ready Processor Entries

By Molly Upton
CW Staff

TOKYO — Although Fujitsu and other Japanese mainframe makers are expected to react to IBM's pricing and product announcements with new products, they welcome IBM's practice of unbundling software and would like to imitate it, according to *EDP Japan Report* (EDP/JR), a newsletter from International Data Corp.

Fujitsu is expected to announce soon an enhanced version of its M-190. It is reportedly a multiprocessor with four CPUs having a price/performance 40% greater than that of the IBM 3033, EDP/JR reported.

And Hitachi is reportedly preparing a competitor to the 3033 and Fujitsu's proposed M-190H for introduction this fall.

Smaller Systems

In the smaller systems arena, Fujitsu has used 16K RAMs in main memory of its M-130 and M-140 systems, which it said offer better price/performance than the 370/115-2 and 125-2.

Memory cost is about 20% to 30% less than with 4K chips, the firm told EDP/JR. Access time of the new chip is from 200 nsec to 300 nsec, according to the newsletter. First deliveries will be in March.

In addition, Fujitsu may also enhance its M180II and M-160 processors, with price adjustments along the lines of those in the 370 series, according to the newsletter.

Nippon Electric Co. (NEC) and Toshiba will probably also effect price and/or product changes in their lines.

But the financial pressure is already being felt by the domestic makers all of whom provide extensive software services without charge.

"It will simply be impossible for us to announce new hardware systems with price/performance comparable to IBM's unless we completely unbundle software and hardware prices," one industry executive told EDP/JR.

Japanese users are reluctant to use packages without extensive tailoring by the systems vendor, according to the report.

One Nippon Univac executive explained: "... The average customers in Japan never accept our standard products as they are; we have to make all the necessary modifications so they can use our program products in their own business environment without making any changes whatsoever."

A survey indicated more than 70% of the applications software used in Japan was developed by hardware manufacturers, compared with less than 20% in the U.S.

Fujitsu incurs a loss on its software service, EDP/JR indicated, principally because of its practice of providing all systems software and most applications software without charge.

The firm spends about 10% of its annual computer business sales on software development, but its income from software services is less than half of the expenditures, EDP/JR said.

The newsletter observed "... Some domestic mainframers are welcoming IBM's policy of charging for certain advanced software systems, because they feel it may get Japanese users accustomed to paying for software products, and thus brighten the profit picture for them."

Severe Competition

There is already severe price competition in the Japanese computer market and the rental policy of the Japan Electronic Computer Co. (JECC) provides a further drain on company revenues, the report said.

The JECC, which is the only major computer rental outlet in Japan, was established by the government in order to eliminate the costs incurred by manufacturers in setting up their own rental bases.

However, JECC requires that a manufacturer buy back the machine from JECC at the depreciated value when returned by the user.

The average Japanese computer user upgrades every three years, so a system with a sales value of $1 million, rented through JECC and returned after three years, will cost the manufacturer $460,000, EDP/JR observed.

Thus the cash squeeze is on, and "many domestic mainframers are experiencing great difficulty generating the funds necessary to operate a profitable computer business," the newsletter continued.

Hitachi and other computer firms are now trying to deal directly with their customers who want leases and JECC's profits have fallen 11% in fiscal 1976.

For its part, Hitachi has reduced dependence on JECC from 35% in fiscal 1970 to 5% in 1975, while its own rental business grew from 51% in 1970 to 55% in the first half of 1976, according to the report.

IBM's share of the Japanese market is only 30%, considerably smaller than elsewhere in the world.

The report lists several reasons for IBM's relatively small base, including: unrestricted price competition; users' affinity for free software and their dislike for standardized program products; and the increased facility with which users can switch from one maker's system to another's.

Small Systems Thrive in Canada

By Bohdan O. Szuprowicz
Special to CW

Ifip Congress 77 will be held in Toronto, Canada, from Aug. 8 to 12 and because it will attract computer industry notables, scientists and experts from all over the world, it is worthwhile to have some idea of what Canada's computer industry looks like.

According to a recent report of the Computer/Communications Secretariat of the Canadian Department of Communications in Ottawa, the total computer population in Canada at the end of 1976 was estimated at 14,355 systems. Another source, the Arthur D. Little research firm, estimated the value of all the installed computers in Canada at about $2.4 billion.

Most of the computing equipment in Canada, in fact an estimated 95% of total value, is imported from the U.S. By 1981, however, when the total installed equipment value may double, it is expected that a drop of about 3% in cumulative U.S. market share will occur.

Of all computers in Canada, about 8,500 or almost 60%, are very small with annual rental value below $12,000. Installations of such very small machines, many of which are in the intelligent-terminal category, are expected to grow at 26% until 1980 and average 12% through 1985.

IBM's Share

IBM, not surprisingly, enjoys the largest market share in Canada, estimated at about 30% of the total number of installations and probably closer to 60% of the total value of installed equipment. Honeywell, Univac, Control Data Corp., NCR and Burroughs are the major runners-up, although Digital Equipment Corp. traditionally enjoyed a large market share of minicomputer installations.

Among other minicomputer suppliers, Hewlett-Packard, Data General Corp., Interdata and Varian are the leaders, although Philips of the Netherlands and now Nixdorf of West Germany are making significant inroads.

In 1974, Canada imported $519.8 million worth of office equipment, computers and peripherals, but it also exported $286 million of the same products. With a large and rapidly growing domestic market, Canadian computer equipment and services suppliers want to develop as large a domestic computer industry as possible.

Immediate Future

For the immediate future, at stake are several billion dollars of DP expenditures by which the total market will grow between now and 1985.

While hardware business is dominated by U.S. manufacturers, in the DP services areas Canadian companies are well ahead.

There is also a lively stock market in the shares of Canadian computer service companies such as Computel Systems, Comtech Group, Dataline Systems, Multiple Access and Systems Dimensions.

The major concern of the Canadian computer industry is whether, as computer use grows, Canadian suppliers will grow with the market.

International News

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Univac Share of Sperry Revenues Hits 45%, Record $1.47 Billion

By Toni Wiseman
CW Staff

BLUE BELL, Pa. — As the largest division of Sperry Rand Corp., Sperry Univac generated nearly 45% of the corporation's revenues and profits in 1976.

Revenues for Univac hit a record of $1.47 billion in 1976, the firm said.

Broken down, 58% of the revenues, or $865 million, was from U.S. business, 35% (including 7% from joint ventures), or $612 million, from international sales.

An examination of the commercial business mix shows 27% attributable to expansions, 30% to new customers (either first-time users or competitive replacement and 43% to replacements and new applications.

Total commercial computer revenues in U.S. markets during the year were $547 million; revenues from U.S. federal government commercial computer installations were $131 million, while business in the private sector, state and local governments generated $416 million, the report noted.

Univac revenues from the OEM/plug-compatible market (PCM) reached $74 million in 1976, an increase of 54% over the $48 million reported in 1975. OEM/PCM bookings rose to $66 million in 1976, a growth of 47% over the prior year.

Worldwide bookings were $1.2 billion in 1976, a 96% increase over the $632 million in bookings recorded in 1971, representing a compound growth rate of 15% for the five-year period, the report said.

At year end, Univac's installed base worldwide was valued at $7.8 billion, it added.

Commercial orders were up by 42% in the quarter over a strong fourth quarter last year and up 12% over a year ago. Computer demand in Europe picked up significantly in the fourth quarter after lagging earlier in the year, according to J. Paul Lyet, Sperry's chariman and chief executive officer.

Order gains for computer systems were spurred by increased worldwide demand and the introduction of several new products such as the large-scale Univac 1100/80 series and the BC/7 small business system, Lyet said. The phase-down of certain office equipment operations continued on schedule and the remaining operations are approaching a break-even position, he noted.

For fiscal 1977, the division expects to meet its objective of an increase of more than 10% in computer revenue and profits, despite the significant impact of an unfavorable foreign currency translation, according to a Univac progress report.

For the year, R&D spending for computers will total about $128 million, the report said, noting R&D spending has grown 120% during the past five fiscal years and totaled $470 million during that period. For the next five years, R&D expenditures are expected to reach nearly $900 million.

The report also noted that the worldwide installed base of Univac general-purpose commercial systems grew 55% from 1972 through 1975, compared to the industry growth of 43%.

Financial News

DP's Profit Profile

NEW YORK — Corporate profit performance for computer firms during the first quarter of 1977 were up 12% over the year-ago period, slightly ahead of the all-industries average of 11%, but far below, for instance, real estate's 179%, railroads' 42% and tire and rubber's 39%, according to figures compiled by *Business Week* magazine.

The industry had total sales revenues of $9.3 billion, up 10% from a year ago. Earnings were $855.4 million.

Data General saw the greatest growth in revenue, 49%, followed closely by Digital Equipment Corp.'s 48%. While IBM had the largest sales total, $4 billion, its revenues were up only 7% over last year.

In terms of profits, however, Memorex, Honeywell and Nashua were the leaders in gains with 118%, 114% and 99% respectively.

Burroughs' revenues gained 9% and its earnings 17%, while Control Data's gains were 10% and 14% respectively.

HIS Has Strong Second Quarter

MINNEAPOLIS — Honeywell's rental and service revenues from its computer business were up 17.1% over the year-ago second quarter — this following a 14.3% gain in the first quarter.

Worldwide sales, rental and service revenues in the second quarter were $705.2 million compared with $600.6 million in the year-ago quarter.

Earnings rose to $29.6 million or $1.41 per share compared with $19.3 million or 95 cents a share a year ago.

For the first six months, total revenues were $1.4 billion compared with $1.1 billion a year ago. Six-month earnings were $60.5 million, or $2.88 a share, including a $6.4 million extraordinary credit. This compares with 1976 six-month figures of $32.9 million, or $1.63 a share, including a $3.2 credit.

Edson W. Spencer, president and chief executive officer, said all major segments of Honeywell's business contributed to the company's performance. Operating margins in the computer business showed substantial improvement over last year's second quarter.

Spencer said Honeywell's prospects for the remainder of 1977 continue to be excellent and as a result, additional investment strengthening long-term product development will be made.

However, he emphasized that the rate of increase the company achieved in the first two quarters of this year would not be maintained in the second half because the third and fourth quarters of 1977 would be compared with much stronger 1976 periods.

Earnings Reports

ADAGE
Year Ended April 2

	1977	1976
Shr Ernd	$.7	$.79
Revenue	5,400,000	5,500,000
Earnings	589,000	709,000

ADVANCED COMPUTER TECHNIQUES
Year Ended March 31

	1977	1976
Shr Ernd	$.11	$.28
Revenue	11,884,685	9,351,718
Earnings	142,672	332,405

AMPEX
Year Ended April 30

	1977	1976
Shr Ernd	$1.31	$.74
Revenue	287,429,000	257,935,000
Disc Op	.....	292,000
Tax Cred	5,435,000	a1,355,000
Earnings	14,224,000	8,032,000
3 Mo Shr	.54	.08
Revenue	78,239,000	67,443,000
Disc Op	.....	292,000
Tax Cred	2,597,000	b(1,361,000)
Earnings	5,853,000	844,000

a-Includes $1,125,000 charge from settlement of class action suits. b-Includes $1,125,000 charge from settlement of class action suits and a reversal of $236,000 tax credit.

ANALOGIC
Three Months Ended April 30

	1977	1976
Shr Ernd	$.53	$.29
Revenue	4,399,220	2,858,695
Earnings	321,437	169,912
9 Mo Shr	1.36	.53
Revenue	11,458,517	7,252,820
Earnings	816,089	311,348

APPLIED DEVICES
Three Months Ended April 30

	1977	1976
Shr Ernd	$.08	$.11
Revenue	6,412,000	5,062,000
Tax Cred	112,000	194,000
Earnings	337,000	425,000
6 Mo Shr	.16	.17
Revenue	11,392,000	9,645,000
Tax Cred	241,000	290,000
Earnings	657,000	641,000

DATA TERMINAL SYSTEMS
Three Months Ended April 30

	1977	1976
Shr Ernd	$.63	$.38
Revenue	8,068,229	4,182,171
Earnings	985,143	503,896

FABRI-TEK
Year Ended April 1

	1977	1976
Shr Ernd	$.06	.....
Revenue	27,661,000	$25,296,000
Disc Op Loss	696,000	425,000
Loss	460,000	1,542,000

Nickels & Dimes

Total Systems, Inc. has agreed to acquire the assets of Anderson, Clayton & Co.'s **mortgage banking services operations** for an amount not to exceed $250,000.

$ $ $

Computer Sciences agreed in principle to purchase 1.5 million shares of its stock from the Jones Foundaton. The firm also agreed to file a registration statement which will enable the foundation to sell an additional 1.5 million shares through a public offering. The foundation is the principal beneficiary under the will of the late Fletcher Jones, cofounder, chief executive and largest shareholder of Computer Sciences until his death in 1972.

$ $ $

Applied Digital Data plans to buy back some of its stock from time to time, a move resulting from a pause in the firm's search for a company to acquire.

$ $ $

Anacomp has declared a quarterly dividend of 5 cents a share payable Aug. 10 to holders of record July 27.

$ $ $

Lexidata has completed a private stock offering to raise additional capital.

$ $ $

National CSS has acquired substantially all of the 50,000 shares of its common stock which it announced its intention to acquire on Jan. 11, 1976.

Almost all of the shares which have been reaquired have been reissued upon exercise of nonqualified stock options or pursuant to the firm's qualified stock purchase plan for employees.

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- Electrical service to computer room consists of two (2) 400 AMP 240 Volt main feeders, plus transformer for 208 Volt system.
- Forty (40) tons of computer room air conditioning from two (2) units.
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STC 'Super Disk' Sales Enjoy Rapid Growth

LOUISVILLE, Colo. — Two hundred fifty installations and still growing at an accelerating rate — that's the current picture of the installed base for the STC 8800 Super Disk, according to Systems Technology Corp. (STC).

STC, which had revenues of $122 million in 1976, began in 1969 with the production of plug-compatible magnetic tape drive products. Today, the company has more than 15,000 tape drive installations and, except for IBM, is the only manufacturer in the world producing drives with a recording density of 6,250 bit/in.

In 1972, STC conducted a study of storage requirement trends. This led to three basic conclusions:

- Disk devices would continue to increase in capacity.
- Increases in capacity would require performance enhancements.
- As capacity increased, the requirement for removability would decrease.

Heeding these conclusions, the company began development of the Super Disk, a storage device which provides 800M bytes of storage; operates with a four-arm rotary actuator to improve performance; and employs fixed rather than removable media for general use — a "first" for this type of product, according to STC.

Designed to operate with the IBM 360/50 and 65 and all 370 systems in high-volume and low- to medium-activity applications, the Super Disk provides performance that is equal to or better than that of IBM 3330 Model 1 and Model 11 disk subsystems at up to 50% less cost, according to Juan A. Rodriguez, STC vice-president of technology.

"The Super Disk offers 800M bytes of storage within 3330 disk architecture in comparison with 100M bytes for the Model 1 and 200M bytes for the Model 11," Rodriguez stated. "Therefore, the storage device can replace eight Model 1s or four Model 11s."

Five-Year Life

According to Rodriguez, the Super Disk was designed to provide maximum reliability and durability over a five-year, round-the-clock machine life. One of the most important factors behind this long life is the use of 3M Co. disks to prevent crashes caused by head/disk interfaces.

Featuring a coating which is used on all 3M disk products, the disks provide maximum surface coating uniformity and resistance to wear, enabling them to exceed Super Disk reliability and life requirements, Rodriguez said.

Furthermore, in production, STC goes beyond other disk manufacturers in terms of inspection and testing operations, according to W. Mike Deese, product engineering manager, disk products. Every disk, head and other component used in the Super Disk's data storage area is screened and inspected at the unit level before assembly.

Every spindle is screened by means of an acoustic signature analysis and all rotors are individually inspected for evidence of bearing damage, he said.

Following unit testing, Super Disk components are assembled and a burn-in test is run for 48 hours. During this test, a random-access program is run and checks are made for any failures of heat-sensitive parts.

Each Super Disk is then operated in a run-in test which continues for up to six weeks. During this test, designed to simulate an actual computer room environment, the storage device continuously runs a random-access program 24 hours a day, seven days a week.

A final system test includes various diagnostic analyses, after which each Super Disk is approved for shipment.

75 to 100 Users

According to Thomas D. Purtell, disk product manager, production volume deliveries of the STC 8800 Super Disk began in late 1975. Since then, 75 to 100 users have installed 250 Super Disks, and monthly shipments continue to grow.

User surveys indicate the Super Disk is being used for about 75% of data storage in a wide variety of different on-line, random-access applications involving large data bases and low to medium activity.

In remaining high-activity, random-access applications involving sort work, spooling files and basic operating system files, smaller capacity disk subsystems are used.

Product Plans

STC is now marketing an 8350 disk drive with two 317.5M-byte drives, which will be completely plug-compatible with the recently introduced IBM 3350 fixed-media disk drive. In addition, the company plans to introduce 8450 and 8850 Super Disks in the near future which will provide 635M bytes and 1,270M bytes respectively of storage capacity within 3350 disk architecture.

In contrast to the company's plug-to-plug compatible disk drives, STC Super Disks are customized to individual customer needs in terms of formatting data and developing inexpensive, effective backup systems, Purtell said.

Saves Money

"It's important to thoroughly understand the performance characteristics of the Super Disk because it is not simply a plug-in device," Rodriguez pointed out. "Used to its full potential, the unit does more than improve system performance; it saves a lot of money.

"In effect, the Super Disk can accomplish all of the functions of virtual disk storage with much higher performance characteristics and much smaller building blocks of storage capacity," the STC vice-president stated.

"Consequently, the Super Disk not only competes successfully with smaller capacity disk subsystems, but offers great advantages in comparison to a mass storage system, because it enables users to economically and efficiently increase their data base as required."

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Contracts

Westinghouse Electric Corp. has been awarded a $12 million contract by Pitney Bowes, Inc. to build a fully automated computer-managed warehouse.

Shugart Associates has received a $5.5 million OEM contract from Standard Electrica SA (Sesa) of Toledo, Spain, the Spanish subsidiary of International Telephone and Telegraph, for Model SA800 floppy disk drives.

Logicon, Inc. has received two contracts, a $4.5 million contract from the Boeing Wichita Co. for the development of a pilot production weapon system trainer for the U.S. Air Force B-52 and KC-135 aircraft, and a $1.1 million contract from the Space and Missile Systems Organization of the Air Force Systems Command.

Moore Systems, Inc. has received a contract in excess of $4 million from the Northeast Utilities Service Co.

Dataproducts Corp. has received a $4.2 million U.S. Navy contract for high-speed teleprinters.

Paradyne Corp. has been awarded a $2.5 million OEM contract from L.M. Ericsson of Sweden for medium- and high-speed modem cards.

Wangco, Inc. has received a $2 million OEM contract for peripheral products from Cobra S.A., Computadores e Sistemos Brasileiros.

Recognition Equipment, Inc.'s subsidiary Recognition Products, Inc. has received a $1.2 million contract from TRW, Inc. for its OCR wand readers.

Conrac Corp. has received a $1.4 million contract from the International Congress Center in West Berlin for display hardware, controllers and digital switching equipment.

Honeywell Information Systems, Inc. has been awarded a contract from the American Society of Travel Agents to conduct a test of a computerized reservation system that will enable travel agents to access several airline reservation systems from a single display terminal.

National Data Corp. has received a contract to furnish its Deposit Reporting System to Bonanza, Burger Chef and Burger King.

Centronics Data Computer Corp. has received two contracts: a two-year contract from Raytheon Data Systems and a five-year contract from International Telephone and Telegraph for computer output printers.

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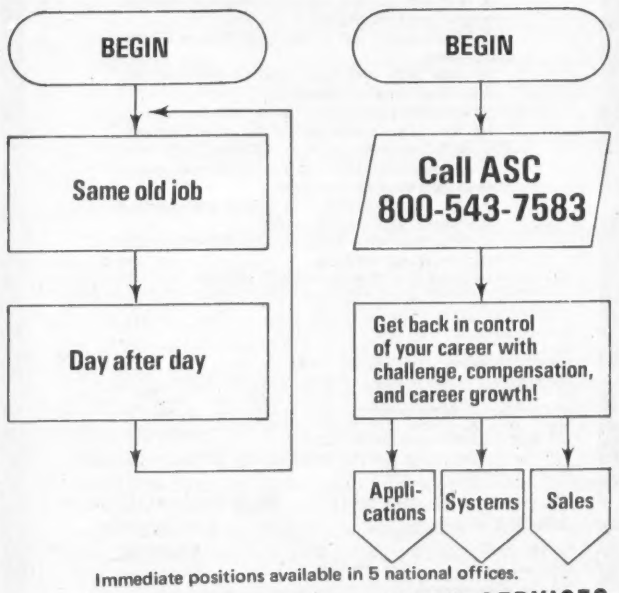

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SENIOR SYSTEMS ANALYST

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NCR

Special Systems Division

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Data Processing

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Programmer/Analyst

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DESIGN ENGINEER

Dynamic data entry systems manufacturer requires Design Engineers with BSME or equivalent and 3-5 years experience on high-speed, computer controlled packaging machinery for design, layout and engineering analysis of small mechanisms and special purpose transport machines.

An outstanding compensation plan, opportunity for professional growth, excellent benefits make this progressive young company a very desirable place to grow.

Please send resume in confidence to F.G. Gahagan, or call toll free

(800) 243-8791

Scan Optics, Inc.

22 Prestige Park, East Hartford, CT 06018
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SENIOR SYSTEMS ANALYST

An immediate position is available for a project leader in our systems department.

The ideal candidate will have:

- College degree or equivalant
- 5 years experience in data processing
- Heavy manufacturing background with BOM experience
- Strong written and verbal communication skills
- Experience in feasibility studies
- The ability to design manual systems as well as data processing systems

Require knowledge of:

- Data Base Management
- Teleprocessing
- Inventory Management

We offer an excellent package of compensation commensurate with experience, full benefits and highly visible opportunities for career and professional growth. Send resume, salary history, and requirements to:

Director of Information Systems
VALLEY INDUSTRIES, INC.
105 South 9th Street
St. Louis, Missouri 63102
An Equal Opportunity Employer

PROGRAMMER ANALYSTS SMALL TOWN ENVIRONMENT/ CLOSE TO SKIING

A large Grain Cooperative located in the Southwest has immediate openings for a Junior and Senior level programmer analyst to assist in the development and implementation of a complete online/ data base oriented management information system on a DEC 20.

Junior Position — Requires a minimum of two years COBOL programming experience. Knowledge of online/DBMS concepts is preferred.

Senior Position — Requires a minimum of five years COBOL programming experience plus actual development and implementation of a DBMS.

Experience in the basic financial applications is preferred with agribusiness knowledge a plus. Promotion opportunities to Data Processing Manager available within one year, salary commensurate with experience and qualifications level. Reply in confidence including salary history to:

Touche Ross & Co.
400 United Bank Center
1700 Broadway
Denver, Colorado 80202
Attn: Jack L. Wagner

UNIVERSITY OF MINNESOTA

If you are an aggressive results-oriented data proc professional, we are looking for you. Continued growth at the University of Minnesota requires additions to our technical support staff during the next 6-8 mos. in the following areas:

OPERATING SYSTEMS
installing, maintaining & tuning MVS/JES2.

TELEPROCESSING
installing & maintaining VTAM, NCP, IMS/DC, INTERCOMM, SSS & TSO.

DISK SPACE MGMT
Managing disk space use on our 3350's.

DATA PROC SUPPORT
installing & maintaining SYNC-SORT, PANVELET & other prog products.

DATA BASE
Supporting IMS appls. during the deisgn, implementation & maintenance phases.

Min. req. BA/BS or equiv training or experience in OS/VS, 3 yrs experience on IBM 360/370.

The University offers a competitive benefits package w/optional paid coursework & optional 4/day work week. Salaries are avail. to 24k+, DOQ.

Send resume or write for an application to: Rod Johnson, University Personnel Dept, 2651 University Avenue, St. Paul, Mn. 55114.
an equal opportunity educator and employer

A leading snack food manufacturer, division of one of the country's best known corporations, seeks result oriented individuals to fill the following new positions in MIS development program.

SR. SYSTEMS ANALYST

Position requires: person seeking high degree of responsibility, challenge and top management involvement; 5-8 years experience in business application preferably in project leader environment; solid experience with on-line data base application; demonstrated success implementing large scale projects; firm grasp of hardware/software utilization, file processing techniques, and DOS/VS, Masters degree preferred.

PROGRAMMER

Position requires: 2-4 years actual applications programming experience in ANS COBOL in IBM 370 environment; must have solid background in coding techniques, testing and JCL; on-line data base experience (CICS/IMS/DL-1) and Bachelors Degree preferred.

Excellent salary commensurate with experience; top benefit package and highly visible opportunities for career advancement and growth.

Send resume and salary history in confidence to: E.L. Hoffman, Jr., Director of Employee Relations.

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113 page research report uncovers areas never published, plus hundreds of how-to-do-it ideas on moonlighting, starting up, image building, bidding, contracts, failure signals, and much more. A superior career planning tool. $12.00 (check, Mastercharge, Bankamericard) Guaranteed Refundable,, to DATASEARCH INC., Suite 108, 730 Waukegan Rd., Dept. G, Deerfield, IL 60015.

Our 1000+ Clients in 48 states are paying fees for Computer Personnel with the following backgrounds/experience. Most listings represent duplicate positions in different geographical locations. Est. 1957.

Data Base Administrator	40-50K
EDP Director/Mgrs.	To 40K
Sales (Hardware/Software)	To 30K
EDP Auditor	18-28K
Tech Services Mgr	To 27K
Project Leader (Bank Insr)	18-25K
MBA's (EDP Background)	16-25K
Management Sci/O.R.	16-25K
M.S., Ph.D. Computer Sci.	15-25K
Systems Prog/Tech Spec.	To 24K
On-Line Financial Sys.	18-23K
IMS P/A	To 22K
Mini, Micro, NC Prog.	To 21K
Scientific Programmer	15-20K
Cobol Prog. OS or DOS	13-29K
Systems 3 Specialist	To 18K
MICR Programmer	18K
Real-Time Programmer	18K
CICS Programmer	16K
Jr. Prog. Cobol/ALC/PL-1	12-16K

Mark Gademsky, CEC
Computer Specialist
Frontier Placement Agency
Suite 1333, Rand Bldg.
Buffalo, NY 14203
(716) 856-4490

PROGRAMMER/ ANALYSTS

Become part of a dynamic, growth-oriented company in the manufactured housing industry. Headquartered in the prime outdoor activity area of Central Wisconsin, Wick Building Systems, Inc., with 13 manufacturing facilities, is the nation's sixth largest manufacturer of mobile homes and the sixth largest manufacturer of panelized homes.

To accommodate our dramatic growth record, our data processing department has need for experienced programmers with a minimum of one year programming experience to work in an IBM 370 environment with teleprocessing which is moving toward PL/1 and Data Base. We offer excellent salary and benefits as well as a participative management environnment which allows for professional and personal growth.

For more information, send resume with salary history to: Corporate Personnel Manager, Wick Building Systems, Inc., P.O. Box 790, Marshfield, Wisconsin 54449. All resumes submitted will be handled on a completely confidential basis.

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WICK building systems inc.

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SENIOR PROGRAMMER

TELECOMMUNICATIONS

Philadelphia based computerzed prescription service firm seeks strongly motivated individual to implement a national distributed network system involving DEC 11/34s. Proficiency in MACRO-11 assembly language is desirable.

Please rush your resume to P.O. Box 373, Ambler, Pa. 19002

TO $30K

OS/VS IN EUROPE

Work in Europe on MVS, SVS, VS1. Travel to accounts as an S.E. or sales support representative. Must handle clients well. Free.

Mail resume or call collect:

Sylvia B. Long
(213) 378-1831 or (213) 990-1875
LONG MANAGEMENT CONSULTANTS AGENCY
15910 Ventura Blvd. Suite 800
Encino, Calif. 91436

FACULTY POSITION IN BUSINESS DATA PROCESSING.
The Data Processing Department welcomes applications for a faculty position available September 7, 1977. A Bachelors degree required, Masters preferred. Three years business data processing experience is required. Rank and salary dependent upon qualifications. Requires strong interest in undergraduate instruction and ability to teach courses in the following areas: Systems Analysis and Programming Languages (COBOL, 360/370 ASSEMBLER, FORTRAN & RPGII). Send complete resume to Professor Stuart J. Travis, Head, Department of Data Processing, Ferris State College, Big Rapids, MI 49307
AAA/EOE

DATA PROCESSING

Director of Instructional Programs

Full-time Faculty position at dynamic private urban college. Information systems & MBA degrees with several years experience in business systems design, applications programming of data center operations and college level teaching preferred. Teach curriculum design & development plus the planning & implementation of special programs. Full benefit package

The Detroit Institute of Technology
2727 Second Ave.
Detroit, MI 48201
ATTN: Personnel Office
Equal Opportunity Employer

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You can get ahead faster with us than with anybody else.

Here's why:

1 You are needed right now. Our project teams are crying for good professionals who can grab hold fast.

2 You'll get a chance to prove how good you are. Everybody is evaluated regularly; there are no missing persons at TI. If you're good, you move up fast. No matter how long the people above you have been there.

3 You'll be involved in state-of-the-art projects. Air Traffic Control. Satellite navigation systems. Landing systems. Radar and infra-red sensor systems. Computer-aided design, manufacturing and electrical test systems, machine tool control, text processing and process control. Acoustic data and image processing. In addition, an Advanced Software Technology Department has been formed to develop state-of-the-art tools, procedures, and languages for computer system design and software production. TI is the technological leader in literally scores of product fields. This leadership has produced more than 5,000 patents.

4 You'll work on a complete system. No threat of getting locked into a repetitious specialty. You'll work on a small project team. You'll interface daily with other disciplines and other phases of your overall program.

5 You'll work in a job-stable, multi-market situation. We have a variety of products and markets. We're not heavily dependent on any one of them—and neither is your job.

Entry Level or Experienced Openings for U.S. Citizens

Software System Designer
M.S. in Computer Science or Engineering and experience in design of software systems for real-time and interactive systems.

Computer System Engineer
M.S. or PhD in Electrical Engineering or Computer Science and five years experience in hardware and software design of real-time computer systems.

Engineering System Analyst
M.S. or PhD in Math, Physics, Computer Science, or Engineering, and experience in analysis of engineering systems.

Programmers
B.S. in Computer Science, Math, Physics, or Engineering and programming experience with higher order languages such as Fortran, Pascal or PL/I. Both scientific and real-time programmers are required.

Language Processor Designers
M.S. or PhD in Computer Science and three years experience in development of programming languages, compilers, translators, assemblers and link editors.

Send your resume in confidence to:
Staffing Manager/P.O. Box 6015, M.S. 222/Dallas, Texas 75222.

TEXAS INSTRUMENTS
INCORPORATED
An equal opportunity employer M/F

D.P. Manager for county governmental agency using teleprocessing-oriented IBM 370/155, 370/158. Responsible for systems design, development, implementation and maintenance, program evaluation, management of departmental D.P. programming and operational staff, coordination with intergovernmental agencies and central D.P. operations. Background in mini-computer applications and distributed processing desirable. Starting salary 16-19K. RESUME to Christine Tompkins, Department of Assessment & Taxation, Lane County Courthouse, Eugene, Oregon 97401. No replies after 19 August. An Equal Opportunity Employer.

Full time faculty position in Computer Science
available beginning in January, 1978. Faculty rank; salary: DOE/QUALS. Duties include undergraduate instruction in systems programming, computer architecture and business systems analysis as well as curriculum development. Minimum educational requirement is a Master's degree in Computer Science or equivalent. Industrial experience preferred. Please send resume (including references) by November 15, 1977 to: Robert S. Shaak, Chairperson, Department of Mathematics and Computer Science, Millersville State College, Millersville, Pennsylvania 17551. Millersville State College is an EO/AAE.

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(212) 661-0670 (agency)
Corporate Inquiries Welcome

Overseas Assignments

Informatics is currently performing a number of new application development projects in Iran and Saudi Arabia. These projects involve state-of-the-art software, hardware and development techniques. On-site assignments range in duration from 3 to 24 months. To the qualified data processing professionals we are seeking, we offer competitive salary plus liberal overseas assignment incentives. These are permanent positions with Onformatics with subsequent reassignment to domestic locations. Skills required include one or more of the following:

***MARK IV * IBM OS COBOL and FORTRAN**
***IMS * UNIVAC OS 1100**
***Banking application design**

U.S. base salary range $18,000 to $30,000
Please send resume with current salary to Informatics PMI, 1121 San Antonio Rd., Palo Alto, CA 94303.

informatics inc

Member SIA Software Industry Association

An equal opportunity employer

EDP Auditor

Blue Cross and Blue Shield of North Carolina, a major health insurance firm, seeks candidates to fill the Plan's EDP Auditor position. Primary responsibility is the ongoing review of EDP activity to evaluate and report on the adequacy of internal controls in existing systems and all proposed new systems. Work environment includes IBM equipment, on-line and off-line applications, and data base files.

Qualified candidate will possess a college degree, preferably in data processing, and a minimum of three years experience in system analysis. COBOL is a must. At least one year's experience as an EDP Auditor is preferred. Send resume establishing qualifications, employment and earnings history, and salary requirements to:

PERSONNEL MGR.
BC/BS of N.C.
P.O. Box 2291
Durham, N.C.
27702

An Equal Opportunity Employer M/F

The University of Michigan — Flint

PROGRAMMER ANALYST

Responsible programming experience (PL/I, FORTRAN & COBOL), knowledge of operating systems. Bachelor's degree is required, Master's is preferred. Work with faculty, staff, and students. Send resume to:

Dr. Samir Kamal
Director, Computer Center
The University of Michigan-Flint
Flint, MI. 48503

The University is an equal opportunity, affirmative action employer.

EDP/MIS CONSULTING

We are a "Big 8" CPA firm with a well established management consulting practice. Our continuing rapid growth has created staff openings in many I.U.S. offices that provide outstanding career opportunities for EDP/MIS specialists.

Our clients include business, financial, manufacturing, health care and governmental organizations. Typical projects include:

- *Development and implementation of financial and operational information, records and support systems*
- *Performance evaluation and hardware/software feasibility studies*
- *Data systems security and internal control reviews*
- *Long range planning using simulation and other techniques*

Because of our size and number of offices, most of our consultants average less than 20% travel.

To qualify, candidates must have a strong academic background and technical expertise gained from 2-3 years creative experience in one or more project areas. Individuals sought also must have the initiative, inquisitiveness, professional capacity, and people and communication skills necessary to develop into future high quality project and practice leaders.

We offer a starting salary commensurate with ability, education and experience, and an environment in which you will directly influence your future advancement rate. If this appeals to you, send resume with salary history in strictest confidence to:

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SENIOR SYSTEMS PROGRAMMER

DCC, a subsidiary of Data General is a leading factor in the mini-computer industry with over 12,000 computers installed. We are expanding our efforts in support of the new SYNERGIST Business System and have an opening for a computer professional.

You must be experienced with ASSEMBLER language on our DCC-116 or Data General's NOVA line. The ideal candidate will be familiar with operating systems and the interfacing of peripherals. We offer a competitive starting salary and a full range of company benefits.

For prompt consideration,
send resume in confidence to:
R. WOODWARD, Manager, Systems

DIGITAL COMPUTER CONTROLS INC

a subsidiary of Data General
12 Industrial Road, Fairfield, N.J. 07006
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PROGRAMMERS

Major commercial finance company, conveniently located in Chicago's Loop is expanding its corporate programming staff. We offer challenging work on diversified accounting applications in a national and international network. Applicants need a minimum of 2 years programming experience using COBOL. Accounting background a plus.

If work on a sophisticated system with data communications interests you, as well as a fine career growth opportunity and excellent benefit package, submit a letter or resume or call in confidence to:

Mrs. D. Rader
(312) 346-2300, Ext. 568

HELLER INTERNATIONAL

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Over 25 major U.S. companies will be in Chicago to interview computer professionals for HUNDREDS OF POSITIONS in the $14,000 to $23,000+ salary range. These key positions will be filled by invited candidates attending the CAREER ADVANCEMENT CONFERENCE sponsored by Control Data Cybersearch.

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To participate, you MUST register. Call Cybersearch any weekday 9 A.M.-9 P.M. Out-of-towners call for interviews. For reasons of confidentiality, if your current employer is an attending company, we will notify you immediately.

Those out-of-town candidates who are invited by Cybersearch will be reimbursed for reasonable transportation expenses.

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NEW HAMPSHIRE ENGINEERING OPPORTUNITIES

Many positions with both large and small commercial companies are now available for qualified Electronic Design E.E.'s, Design M.E.'s, Manufacturing Engineers, and Field Engineers. Salaries range from $14-$25K. In many cases the company will pay relocation. Please call or write in confidence, including salary and location desired, to Fred Johnson.

DATA PROCESSING OPPORTUNITIES

We are seeking 1. PROGRAMMERS 2. PROGRAMMER/ANALYSTS 3. SYSTEMS ANALYSTS. Our needs cover all applications, regardless of hardware. We currently have hundreds of openings listed with many exclusives. Salaries are competitive, and all expenses assumed by client companies. Please forward resume or call if you are looking for a new opportunity in our area. Ask for Bud Ralph.
(603) 893-4511

CORICO CORP.
301 South Braodway
Salem, NH 03079

PROGRAMMING

The University of Delaware is seeking candidates for openings in the following areas of administrative data processing.
Senior Programmer Analysts — responsible for the design, programming, and implementation of university administrative computer applications with some experience with Burroughs equipment. Minimum qualifications require equivalent of a bachelor's degree with 3 to 4 years' effective experience.
Programmer Analyst — responsible for the design, coding and testing of university administrative programs including systems testing, user training, and preparation of final documentation with some experience with Burroughs equipment. Minimum qualifications require equivalent of a bachelor's degree with 1 to 2 years' effective experience.
These positions represent an opportunity to work within a centralized university computing center utilizing advanced teleprocessing and data base techniques on a large scale Burroughs B7700 system.
Submit resume including salary requirements by August 15, 1977, to Daniel J. Helmerich, Manager, Administrative Systems

Computing Center
192 S. Chapel Street
University of Delaware
Newark, DE 19711
AEO/AAE

PROGRAMMER

Career-Building Responsibilities

High volume, Northern New Jersey Consumer Products Manufacturer, has a rewarding career opportunity for a Programmer with 1-2 years experience in COBOL commercial applications. Requires at least 1 year experience in medium and/or large scale Burroughs environment, and/or IBM 360/370 OS/DOS, and the ability to carry out projects from inception to installation. Excellent starting salary and company paid benefits package. Please send resume and salary requirements, in confidence to:

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One of the leading specialized softgoods manufacturers is expanding its DP staff. 5+ years DP experience, know COBOL and data base to design new systems. Good communications skills. IBM 370/158 MVS. Prestigious!
$22,000 **FEE PAID**

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GROWTH EDP POSITIONS

The Computer Systems Division of Harris Corporation has the following positions available at their Fort Lauderdale location.

ASSOCIATE PRINCIPLE HARDWARE ARCHITECT

A major position responsible for planning, development and documentation of functional requirements consistent with marketing requirements, state-of-the-art technology, current product line and planning as it would relate to future product lines. The individual we seek should have a minimum of a BSEE (MSEE preferred) plus 5 years' exposure in the design of digital computers. An aptitude for technical writing would be of tremendous value in accomplishing position goals. This is a systems management position.

PRODUCT MARKETING MANAGER S-100/S-200

We require a senior marketing manager to direct market penetration and primary product development of the S-100/S-200 and related VULCAN. An experienced hardware and peripheral sales background coupled with a capacity of product planning, communications, forecasting and competitive analysis will be helpful. A degree is perferred plus a proven sales track record.

SOFTWARE INSTRUCTORS

There are two software instructor positions available which require proven experience in the documentation and teaching of operating systems, language processors and data base management. A BS degree with 2 years programming experience in industry or commerce as well as communications skills are required.

CSD is one of the most rapid growing divisions of Harris Corporation. Career opportunities exist and will continue to present themselves due to rapid expansion.

Send your resume and salary history in strictest confidence to W.D. Taylor, Harris Corporation, Computer Systems Divison, 1200 Gateway Drive, Fort Lauderdale, Florida 33309.

HARRIS
COMMUNICATIONS AND INFORMATION HANDLING

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SENIOR SOFTWARE DEVELOPMENT PROFESSIONAL

Unique Opportunity With Rapidly Expanding Firm

AMS seeks an experienced, creative software development professional to fill a key position in our software development group. This group supports our business by developing generalized software for use in financial, order entry, order processing and inventory control applications.

Starting in 1970, AMS has expanded into a nationwide systems consulting and development firm; annual sales for 1977 are projected at $20 million. To sustain our tremendous growth, AMS has established several large projects for developing software which forms the basis for our proprietary products. At present, our focus in on the DEC PDP-11 using RSX-11M.

The person we seek must have demonstrated success in design and implementation of sophisticated, generlized software such as DBMS, procedural languages, decision-table processors and report writers. The key quality is the creative design and implementation of software which is to be used as the foundation for application products.

AMS salaries are in the upper range for the industry, and the starting salary will be commensurate with experience and qualifications. There is opportunity for rapid advancement, profit sharing and stock options; the working environment is exceptional — a talented, creative team; dedicated computers and terminals.

If you believe you are one of the best in this field, please send us your resume and we will respond promptly. We want to fill this position as soon as possible but not later than September 1.

Frank A. Nicolai
Executive Vice President
AMERICAN MANAGEMENT SYSTEMS, INC.
1515 Wilson Boulevard Arlington, Virginia 22209

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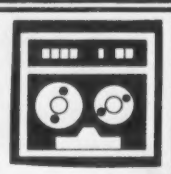
SYSTEMS ANALYSTS



Professional Growth

Your capabilities will be appreciated and well utilized in the M.I.S. Department of our nationally prominent northern New Jersey-based corporate computer center. Here you'll collaborate with a first-rate team of computer professionals working toward state-of-the-art business applications. We seek candidates with automated financial systems analysis experience, extensive user contact background, programming experience including COBOL and RPG, and, preferably, familiarity with software package installations. You can look forward to a starting salary to $23K, a broad benefits package, challenging assignments, ever-increasing responsibility and unique growth opportunities with a rapidly expanding organization. Send resume including salary history in confidence to

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San Francisco Peninsula

FOUR-PHASE SYSTEMS, leader in the distributed processing field, has career openings for qualified IBM/370 COBOL Professionals in our Information Services Group.

We offer rapid advancement and increased responsibility in a fast-packed, results-oriented environment with the opportunity to interface with sophisticated MIS and user groups.

If you are a Project Leader or Sr. Programmer/Analyst with 3-5 years of design, analysis and programming experience in Field, Manufacturing or Marketing Systems, and are looking for professional growth in both IBM/370 and minicomputer system development, send resume & salary history to C. Horn, Professional Employment (refer to 8300), FOUR-PHASE SYSTEMS, 10700 No. De Anza Blvd., Cupertino, CA 95014. (408) 255-0900. Individuals only apply. Equal employment opportunity is our pledge & practice.

Four-Phase Systems
Advanced Technology for Distributed Processing

The Software Documentation people we're looking for probably aren't looking for a job.

We're the Digital Software Documentation Group, a proud collection of Writers and Editors. We like being part of this organization, not just because Digital is an important computer company, but because we're important to Digital.

We are on an equal footing with the Software Development organization, not a step below it. This is reflected in our salaries, our autonomy, our enthusiasm, and our corporate clout. We're not used to getting a lot of empty promises. What we do get is the necessary funding for our projects and enough freedom to produce the kind of documentation end-users can really sink their teeth into.

We have some of the best software documentation people in the business. And now we want the rest of the best because this group is determined to produce nothing but the highest quality work. We're looking for great Writers, Editors, and Programmers with a flair for writing; people doing fine where they are but who would thrive in an organization that provides a great challenge to grow.

What Do We Offer You?

An opportunity to work for a comany that recognizes the importance of software documentation; to be an integral part of the development team.

An opportunity to work with a highly autonomous, highly charged group, where quality, not volume, is the objective.

An opportunity to experience real freedom, to take what has to be done and put your personal stamp on it.

An opportunity to have real impact on the support group, Digital, and the industry as a whole.

An opportunity to be catapulted forward in your career and choose your own directions to move in. You can follow either the administriave or technical path of our dual career program. Either way there will be personal satisfaction and, of course, compensation.

If this is the kind of involvement you're looking for – or if you'd just like to learn more about us – let's talk.

Forward your resume to Theresa Buckley, Digital Equipment Corporation, Dept. 8, 162 Main Street, Maynard, Massachusetts 01754.

We're the company looking for people.

digital
digital equipment corporation
an equal opportunity employer m/f

DATA BASE SYSTEMS

Definition, Planning & Design

Michigan Consolidated Gas Co., the largest natural gas distribution company in Michigan, is looking for innovative problem-solvers with in-depth experience in phased conversion to a data base. Working in a 360/370 environment, you will be responsible for the development of long range systems plans within a data base framework.

Preferred candidates will possess a Master's degree in Computer Science, Systems Management or Management Science with experience in designing software for management systems, including large scale data base. The ability to work independently and good communications skills at all technical and management levels are also important.

We offer a very competitive salary, excellent benefits and the growth potential of a major member of the energy community. Please send your resume including salary history and requirements to N. Shead, Professional Placement, Michigan Consolidated Gas Company, One Woodward Avenue, Detroit, Michigan 48226. We are an equal opportunity employer m/f.

MICHIGAN CONSOLIDATED GAS COMPANY

PROGRAMMER ANALYST

Immediate opening in an expanding Southeastern New England manufacturing firm for an individual with a minimum of three years in programming with emphasis in Systems Design. This individual will be involved in both systems design and programming. The environment is a S/370, operating under DOS/VS with Tele-Processing in the near future.

We offer a progressive benefit package and starting salary commensurate with experience.

Qualified applicants are invited to send resume or letter outlining work history and salary requirements to:
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Asst. Dir. of Group Sys 18K
Group Ins. knowledge with OS exp. to assist in design of Group Systems

Group Systems Specialist 15K
Knowledge of APL and strong in Math

PARKER PAGE ASSOCIATES
P.O. Box 12308
Seattle, WA 98111
Offices: Seattle, Wash., D.C., Michigan, Atlanta

MANAGER OF COMPETITIVE ANALYSIS

MDS is the leading independent supplier of data entry and communications systems in the industry. Due to expansion & growth through the introduction of new series of distributed processing systems, we have an exceptional career opportunity for a professional to play a significant role in the future of MDS as a key member of the product marketing team.

The successful applicant will have a minimum of 3 yrs. systems and 1 yr. competitive analysis with vendors of data communications & distributed processing systems.

In addition to an excellent compensation & fringe benefit program, we offer you the opportunity to grow with us as we continue to introduce significant new systems. For consideration please send resume including present salary to:

Mr. D.P. McCONNELL
Director of Corporate Personnel
Mohawk Data Sciences
1599 Littleton Road
Parsippany, New Jersey 07054
An Equal Opportunity Employer (M/F)

MDS

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SYSTEMS ANALYSTS PROGRAMMERS

Positions are open for people with on-line applications experience.

Prefer some design background. Must know Cobol. Will develop CIF on large systems. Banking applications a plus. Call the Boston Five Cents Savings Bank at 742-6000, extention 393.

The Boston Five

24 School Street., Boston, MA. 02108

An Equal Opportunity Employer

SOFTWARE/ FLORIDA

Real-Time Monitor and Control

Computer based process control systems company located in desirable sun "n" surf Florida coastal city is searching for Systems Applications Programmers. All leveles of development, design and project implementation.

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Also have several openings for hardware design and logic engineers. All fees and relocation paid by client company. Send current resume including salary history to:

CAREER SPECIALISTS
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Washington, D.C. office of Major Consulting firm has opening for Programmer/Analysts competent in FORTRAN and PL/1 or COBOL, IBM 370 JCL (OS), and experience in operations research, statistical and transportation modeling applications. Salary commensurate with experience. Please forward resume and salary requirements to:

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Perform emergency and preventative maintenance on our Xerox Sigma 9 and 940 Computer Systems with High Speed RADS Disk Units, Magnetic Tape Units and Line Printers attached to the Central Processor.

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Dennis Schrag, Chr.
ATECC
C/O Northern Trails
Area Education Agency
Box M
Clear Lake, IA 50428

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COMPUTER SCIENCE/MATH
MATHEMATICS DEPARTMENT
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RIVER FALLS
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Send resume to:
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Dept. of Mathematics
Univ. of Wisconsin/
River Falls
River Falls, Wisc. 54022
WU-RF is an equal opportunity/ affirmative action employer.

Programmer

SYSTEMS PROGRAMMER

Senior-level systems programmer opening which requires experience in designing and installing computer measurement and accounting systems including charging and allocations systems. Strong working knowledge of PL1. Experience in performing computer hardware or software evaluations and studies and as project leader on computer software projects. Skills in one of the following areas: computer output microfilm, other programming languages, computer requirement studies, experience using graphics, knowledge of mini- and microcomputers.

Send resume with salary history to:

Stanford Center for Information Processing
c/o C.W. Coulter
Encina 30
Stanford, CA 94305
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Information Systems
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Burroughs or IBM, resp for design, programming, and documentation

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Current employment will be protected. Send resumes, including present and desired salary and relocation information to: Frank Parks

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We need programmers, analysts, for our good client firms. You must be sincere in your desire to make a career change and actively engaged in:

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(813) 872-1853

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Prefer a degree and minimum 2 years experience which must include programming in an ANS COBOL, OS, JCL environment. Assignments will involve some travel and have user contact at both plant and staff levels.

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Degree and manufacturing systems background with a minimum of 3 years experience. Both design and development opportunities. Experience must include programming in an ANS COBOL, OS, JCL environment. Must be able to deal effectively with line and staff functions in coordinating their systems requirements.

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Major chemical company seeks a responsible individual with a minimum of three years scientific programming experience on major computer systems utilizing FORTRAN. Knowledge of COBOL and IMS a definite plus. Degree preferred.

Responsibilities will include the design, development and implementation of scientific-oriented computer applications.

We offer an excellent compensation and benefits program and a professional growth-oriented work environment. Qualified applicants should submit resume including salary requirements to:

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data processing

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Harper Hospital Division
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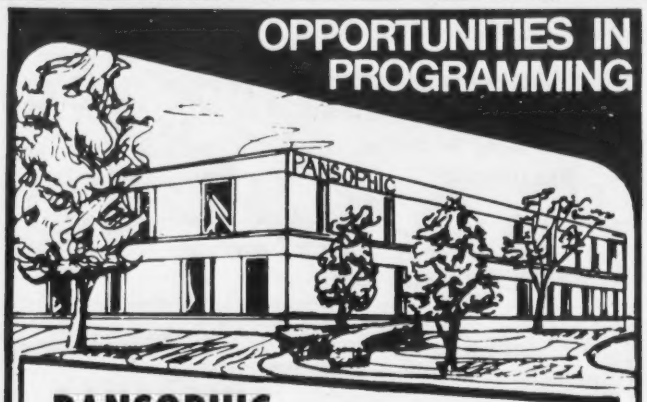
OPPORTUNITIES IN PROGRAMMING



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We offer an exciting work environment, good compensation, liberal benefits and opportunities for advancement in software development sales management. For consideration send resume or call collect:

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SYSTEMS PROGRAMMER (IBM S/370-158)

The State University of New York (SUNY) at Binghamton seeks an individual with a minimum of 2 years experience in systems programming. Experience should include SCP generation, program product installation and maintenance, and proficiency in BAL and PL/I. MVS experience a plus. Minimum of a bachelor's degree required.

SUNY-Binghamton is one of four university campuses in the State University of New York System. The campus of 9,300 students is located near a variety of recreational and cultural resources. A competitive salary ($13,500-$16,000) and oustanding benefit package are being offered.

Please send resume and salary requirements by August 15, 1977 to:

Allan R. Getman
Associate Director
Computer Center
SUNY-Binghamton
Binghamton, New York 13901

SUNY-Binghamton is an equal opportunity/affirmative action employer.

FACULTY POSITION IN COMPUTER SCIENCE

The University of Alabama in Huntsville welcomes applications for the computer science faculty position on tenure track, available September 1, 1977, at rank of Assistant or Associate Professor depending upon experience and qualifications; deadline for application is August 15, 1977. A Ph.D. in computer science or allied areas is required. Academic and/or computer-related industrial experience is preferred. Responsibilities will include teaching and thesis advisement in one or more of the following areas (in order of preference): Artificial Intelligence, Operating Systems, Microcomputer and Its Applications, Computer Architecture, Data Base Management, and Software Engineering. Send resume and transcripts along with names and addresses of at least three references to:

Computer Science Program
The University of Alabama in Huntsville
P.O. Box 1247
Huntsville, AL 35807

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System Programmers

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6610 West Broad Street
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Technology development would include experience in one or more of the following disciplines:

- **Data base management/distributed processing,**
- **Image processing,**
- **Computer networking/ARPANET protocols,**
- **Microprocessor software development,**
- **Operating systems (UNIX, RSX-11D)**

Experience in real-time communication systems with experience in one or more of the following:

- **Packet switching**
- **Security kernel**
- **Operating systems**
- **Test and diagnostics**
- **On-line/off-line T&D routines**
- **Integration & testing of real-time systems**

For consideration, please send resume with salary history/requirements to Professional Employment, Dept. JJL-32. U.S. citizenship required.

Ford Aerospace & Communications Corporation
Western Development Laboratories Division
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Work with some of the most sophisticated installations in the world supporting our line of IBM OS and OS/VS system performance products. Requires a demonstrated desire to work with people and background in two or more of the following: OS COBOL programming, JCL and utilities, system tuning techniques, user training.

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PROGRAMMERS

software design opportunities

PROGRAMMER/ANALYSTS

Lexar Corporation, developer of sophisticated micro-processor based telecommunications and word processing systems, has several openings for outstanding Programmer/Analysts. Applicants MUST have recent experience programming realtime, on-line systems utilizing assembly language on micro or mini computers. The positions will entail the design and development of software systems including coding, debugging and documentation.

If you enjoy working with advanced technologies and bright people in an informal atmosphere, please send your resume and salary history to:

Susan Davis
Personnel Manager

LEXAR CORPORATION

11611 San Vicente Blvd.
Los Angeles, Calif. 90049

Equal Opportunity Employer M/F

LEXAR

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If you have the leadership potential to direct our migration to a total data-base environment, the ability to supervise and develop a growing staff, and stay on top of the detail work — we can offer you the Number One position you deserve.

The ideal candidate we seek should have specific experience with a data-base administration unit in a large installation. This should include handling organization and procedures for normal operations, as well as data-base physical design, programmer training, Sysgens, recovery and integrity design, troubleshooting, IMS/VS internals. Should also have experience in at least two of the following:

- Data dictionary development and installation
- Data-base systems planning and design
- Data-base operations

This is a newly created position offering an exceptionally high degree of corporate visibility. Excellent starting salary is accompanied by a comprehensive package of benefits which includes relocation assistance to our beautifully situated Jersey Shore corporate headquarters.

For prompt, confidential consideration, forward your resume, including salary history and requirement, to: Mr. Richard Fearn

INSCO

a subsidiary of The Continental Corporation
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An equal opportunity employer M/F

Harris Corporation, Data Communications Division, a leader in data communications, seeks

SYSTEMS ANALYSTS

SAN FRANCISCO & CHICAGO areas

You should have a degree and two plus years of programming background in COBOL and ASSEMBLER languages with experience in teleprocessing and mini-computers. Prefer individuals with marketing orientation and some mainframe computer systems experience. Qualified candidates must presently reside in areas indicated, no relocation.

We offer an excellent salary, complete benefits package, and a good potential for future career growth.

For prompt consideration, please call COLLECT
Carole Burns (214) 620-4196

or send resume including salary history and requirements to her at: Harris Corporation, Data Communications Division, P.O. Box 44076 Dallas, TX. 75234

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Must be a graduate of a recognized data processing or computer science program and be competent in Cobol and PL/I. Experience in IBM 360 or 370 Assembler Language highly desirable.

For confidential attention, please send resume to:

Director of Personnel
Western Kentucky University
Bowling Green, KY 42101
Equal Opportunity Employer

DATA BASE MANAGER

Responsibilities will include operational control of the University's data base and management information systems, develop standards for data elements and structures, and assure the quality control of application programs. The data base is presently under development and the first module is expected to become operational in July. Requires a Master's Degree in computer science, or a computer-realted discipline, at least four years of programming/analysis experience including the design and implementation of data bases, and a strong ability to communicate with administrative personnel. Knowledge of and experience with DEC system 1080 and DBMS-10, MCS-10 will be highly desirable. Send resume to Mrs. Betty Miles, University Personnel Services, University of Louisville, Louisville, Kentucky 40208.
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B6700

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Requires 2 or more years experience with DCALGOL and NDL and preferably network design and some COBOL as well. You'll play a key role in developing and streamlining message control systems for RJE and transaction processing. You'll also participate in the selection, installation and monitoring of terminals, distributed mini-computers, and communications equipment.

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Requires 5 or more years of demonstrably successful experience in managing and implementing manufacturing systems including inventory management, capacity planning, engineering and labor control. A background that includes data base management systems and techniques on any computer is a definite plus.

Please send confidential resume, indicating position and your current base salary to: Director of MIS, General Instrument Corporation, 225 Allwood Road, Clifton, NJ 07012.

GENERAL INSTRUMENT CORPORATION

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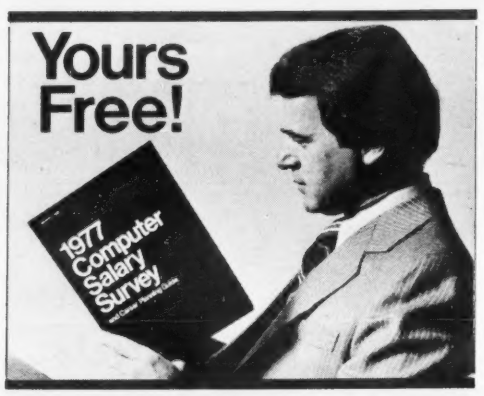

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Source Edp's *1977 Computer Salary Survey* is now available. This authoritative and up-to-the-minute report will allow you to compare your compensation directly with professionals across the country performing the same duties you perform. It also examines in detail the strategies and techniques thousands of successful computer professionals have used to enhance their careers. After fifteen years of recruiting experience, Source Edp knows how you can gain broader professional exposure, maximize your compensation and break into management. It's all in Source Edp's *1977 Computer Salary Survey* and career planning guide.

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New York	212/736-7445	Fort Worth	817/338-9300
Philadelphia	215/665-1717	Houston	713/626-8705
Union, N.J.	201/687-8700	New Orleans	504/561-6000
Wash., D.C.	703/790-5610		
Wellesley, Ma.	617/237-3120		
Midwest		**West Coast**	
Chicago	312/782-0857	Encino, Ca.	213/995-8866
Oak Brook, Il.	312/986-0422	Irvine, Ca.	714/833-1730
Cleveland	216/771-2070	Los Angeles	213/386-5500
Detroit	313/352-6520	Oakland	415/444-5955
Kansas City, Mo.	816/474-3393	Palo Alto	415/328-7155
Minneapolis	612/544-3600	San Francisco	415/434-2410
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Top salaries, fully-paid fringes including life, health and dental insurances, moving allowance and educational benefits. To arrange an interview, call or send your resume to: Ms. Norma Mitchell

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RSVP SERVICES
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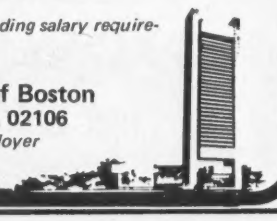
TECHNICAL ADVISOR

Operating Systems Support

The Federal Reserve Bank of Boston seeks a systems programmer with Burroughs medium systems experience to assist in the enhancement and maintenance of vendor supplied software such as Operating Systems (MCVP), Spooling Utilities, Remote Job Entry Communication Frontend Software including Host Control Software, and to develop and maintain operationally-oriented programs in the following areas: Hardware malfunction detection and isolation; operator/MCP interface; computer to computer data transmission. Position requires B3500 or B4700 experience, a working knowledge of operating systems concepts; 2-5 years' experience in systems programming.

Please submit detailed resume including salary requirement to Ms. Sally Portle:

Federal Reserve Bank of Boston
30 Pearl St., Boston, MA 02106
Equal Opportunity Employer



TECHNICAL DIRECTOR OF DATA PROCESSING

NATIONAL OPINION RESEARCH CENTER

NORC is a not-for-profit social science survey research organization affiliated with the University of Chicago, with central office in Chicago and a New York office. NORC employs 300 persons, and a large national field staff is maintained.

Immediate opening for Technical Director of Data Processing, based in Chicago. This position plans and supervises the activity of 15 to 20 employees in NORC's data processing departments in Chicago and New York. Specific duties include:

planning and evaluation of software for eventual importation or internal development; development and operation of data base entry and editing facilities; planning and decision-making in the area of proposal development and proposal writing; responsibility for Data Processing budgeting and budget management; interaction with operations and administrative staff of organization.

Requirements include: some post-BA education in computer science or a related field desirable; an MBA, MA, or equivalent ideal. Work experience with data processing, ability to design and evaluate software, and writing skills essential. Familiarity with IBM 370/OS and some exposure to on-line systems essential. FORTRAN essential, PL/1 desirable, and some exposure to Assembler language useful.

Salary range from $18,000-$25,000, depending on experience. Submit resume to:

Garth Taylor, Chairperson
DP Director, Search Committee
Nat'l. Opinion Research Center
6030 S. Ellis Avenue
Chicago, IL 60637
AAA/EOE

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WCS

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SYSTEMS ANALYST

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Please call or write for an interview.

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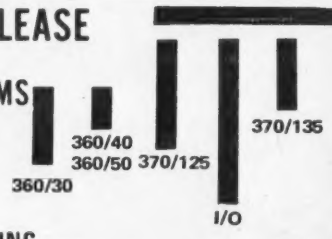

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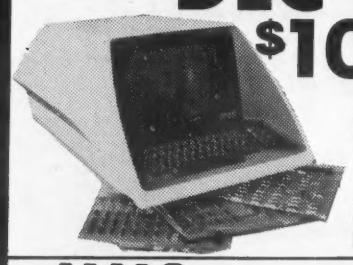

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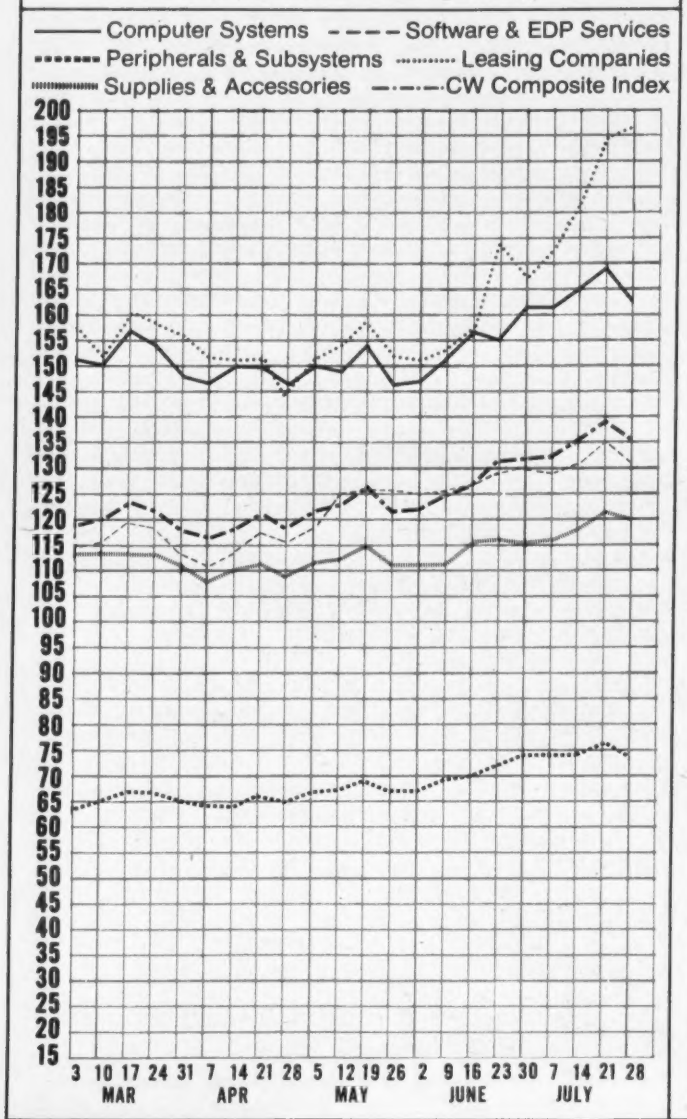

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Shr Ernd	$.77	.....
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Earnings	3,539,000	(942,000)

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	1977	1976
Shr Loss	$.04	$.06
Revenue	1,182,172	959,771
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	1977	1976
Shr Ernd	$.20	$.16
Revenue	5,312,336	2,948,640
Tax Cred	91,500	.....
Earnings	375,588	296,006

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Year Ended March 31

	1977	1976
Shr Ernd	$1.14	$.90
Revenue	12,593,081	8,146,352
Earnings	1,419,335	1,089,357
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Year Ended March 31

	1977	1976
Shr Ernd	$.44	$1.02
Revenue	7,348,903	6,890,677
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Earnings	590,174	1,330,519

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Three Months Ended April 30

	1977	1976
Shr Ernd	$.08	($.57)
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TRADE*QUOTES.

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 27, 1977

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1977 RANGE (1)	CLOSE JUL 27 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	0- 39	31 1/4	-1	-3.1
N	BURROUGHS CORP	55- 91	66	-2 5/8	-3.8
O	COMPUTER AUTOMATION	18- 28	26 1/4	- 1/2	-1.8
N	CONTROL DATA CORP	20- 26	21	-1 5/8	-7.1
N	DATA GENERAL CORP	35- 50	46 1/8	-3 3/8	-6.8
N	DATAPOINT CORP	18- 30	26 5/8	- 3/4	-2.7
N	DIGITAL EQUIPMENT	37- 53	46 3/8	-2 3/8	-4.8
N	ELECTRONIC ASSOC.	2- 3	1 7/8	- 1/8	-6.2
A	ELECTRONIC ENGINEER.	8- 10	8 3/4	0	0.0
O	FOUR-PHASE SYSTEMS	13- 17	15	- 1/4	-1.6
N	FOXBORO	42- 54	47 3/8	- 1/8	-0.2
O	GENERAL AUTOMATION	6- 9	7	- 3/8	-5.0
C	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	69- 87	79	-3 1/4	-3.9
N	HONEYWELL INC	44- 55	51	-2 5/8	-4.8
N	IBM	245-286	267 1/2	-5 1/2	-2.0
O	MANAGEMENT ASSIST	5- 9	6 1/2	- 1/4	-3.7
O	MEMOREX	23- 29	26 3/4	-1 1/4	-4.4
O	MICRODATA CORP	7- 18	9 1/2	- 3/8	-3.7
O	MODULAR COMPUTER SYS	5- 8	7 1/2	- 3/8	-4.7
N	NCR	32- 43	42 1/8	+ 1/8	+0.2
O	PRIME COMPUTER INC	12- 18	17 1/2	+ 1/8	+0.7
N	PERKIN-ELMER	17- 22	19 3/4	-1 3/8	-6.5
N	RAYTHEON CO	16- 33	29 1/2	-2	-6.3
N	SPERRY RAND	34- 42	35 3/4	-1 3/4	-4.6
O	SYCOR INC	8- 15	10 1/4	+ 3/8	+3.7
A	SYSTEMS ENG. LABS	5- 8	7 1/8	-1	-12.3
N	VARIAN ASSOCIATES	15- 21	18	-1 1/8	-5.8
A	WANG LABS.	14- 21	19 1/8	- 3/4	-3.7

LEASING COMPANIES

EXCH		1977 RANGE (1)	CLOSE JUL 27 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COURIER CORP	8- 10	10 1/4	+ 1/8	+1.2
O	COMDISCO INC	10- 13	11	+ 3/4	+7.3
A	COMMERCE GROUP CORP	2- 2	2	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	7/8	0	0.0
M	DATRONIC RENTAL	1- 2	1 1/8	0	0.0
A	DCL INC	1- 2	2	0	0.0
N	DPF INC	6- 9	8 1/8	- 1/2	-5.7
N	ITEL	13- 20	18 1/8	-1 1/2	-7.6
N	LEASCO CORP	19- 27	26	+1 1/8	+4.5
O	LEASPAC CORP	1- 2	1	0	0.0
C	NRG INC	0- 0	1/4	+	+25.1
A	PIONEER TEX CORP	5- 11	5 7/8	- 1/8	-2.0
N	U.S. LEASING	10- 15	14 1/2	- 1/4	-1.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1977 RANGE (1)	CLOSE JUL 27 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
O	ANACOMP INC	7- 10	9 3/8	+ 1/8	+1.3
A	APPLIED DATA RES.	5- 10	9 1/8	- 3/8	-3.9
N	AUTOMATIC DATA PROC	23- 30	28 1/4	- 3/4	-2.5
O	COLEMAN AMERICAN COS	2- 2	2	0	0.0
O	COMPU-SERV NETWORK	10- 15	10 1/4	-1 1/4	-10.8
O	COMP ELECTION SYSTMS	6- 9	9 1/4	0	0.0
O	COMPUTER HORIZONS	1- 1	1 1/4	0	0.0
O	COMPUTER NETWORK	6- 7	6 5/8	+ 1/2	+8.1
N	COMPUTER SCIENCES	7- 9	7 5/8	- 3/4	-8.9
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	1- 3	1 1/2	0	0.0
O	COMSHARE	5- 7	6	- 1/2	-7.6
O	DATA DIMENSIONS INC	3- 5	3 1/8	- 3/8	-10.7
O	DATATAB	1- 2	1 7/8	0	0.0
N	ELECTRONIC DATA SYS.	16- 20	18 5/8	- 1/4	-1.3
O	INSYTE CORP	2- 3	1 3/4	- 1/8	-6.6
O	IPS COMPUTER MARKET.	1- 2	1 1/2	0	0.0
O	KEANE ASSOCIATES	3- 4	4 3/8	- 1/2	-10.2
O	KEYDATA CORP	2- 3	1 7/8	+ 1/8	+7.1
A	LOGICON	7- 17	13 1/8	- 3/4	-5.4
A	MANAGEMENT DATA	1- 2	1 1/2	- 1/8	-7.6
A	NATIONAL CSS INC	19- 25	22 3/4	-1 1/8	-4.7
O	NATIONAL DATA CORP	4- 7	5 7/8	- 1/4	-4.0
A	ON LINE SYSTEMS INC	17- 22	19 1/2	+ 1/4	+1.2
N	PLANNING RESEARCH	3- 6	5 1/4	+ 1/4	+5.0
O	PROGRAMMING & SYS	1- 1	1/2	- 1/8	-20.0
O	RAPIDATA INC	2- 3	2 3/8	- 3/8	-13.6
O	REYNOLDS & REYNOLD	17- 20	19	- 3/4	-3.7
O	SCIENTIFIC COMPUTERS	1- 3	3 1/4	+ 1/8	+4.0
O	TYMSHARE INC	14- 23	21 1/4	- 1/4	-1.1
A	URS SYSTEMS	4- 5	4 1/8	- 1/8	-2.9
N	WYLY CORP	1- 2	1 3/8	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1977 RANGE (1)	CLOSE JUL 27 1977	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	10- 15	13 1/2	- 3/4	-5.2
O	ADVANCED MEMORY SYS	7- 9	8 1/8	0	0.0
N	AMPEX CORP	8- 11	9 7/8	-1 1/8	-10.2
O	ANDERSON JACOBSON	3- 5	4 1/4	0	0.0
N	APPLIED DIG DATA SYS	10- 16	13 1/4	-1 5/8	-10.9
O	BEEHIVE INT'L	8- 12	9 1/4	- 3/8	-3.8
A	BOLT,BERANEK & NEW	7- 8	7 3/4	+ 1/2	+6.8
N	BUNKER-RAMO	8- 12	10 7/8	+ 1/8	+1.1
A	CALCOMP	3- 5	2 3/4	- 1/4	-8.3
O	CAMBRIDGE MEMORIES	1- 3	2 5/8	- 1/8	-6.6
N	CENTRONICS DATA COMP	22- 29	26 1/4	-2 3/8	-8.2
O	COGNITRONICS	1- 1	1/2	0	0.0
O	COMPUTER COMMUN.	5- 6	6 1/4	- 3/8	-5.6
O	COMPUTER CONSOLES	4- 7	4 3/4	0	0.0
A	COMPUTER EQUIPMENT	2- 3	3	0	0.0
O	COMPUTER TRANSCEIVER	1- 1	1 1/8	+ 1/8	+12.5
O	CONTEN	9- 13	10 3/4	- 1/8	-1.1
N	CONRAC CORP	19- 28	21 7/8	- 1/2	-2.2
O	DATA ACCESS SYSTEMS	4- 5	3 3/4	- 1/4	-6.2
O	DATA 100	6- 9	7 1/2	-1	-11.7
A	DATA PRODUCTS CORP	9- 15	14 3/8	- 3/8	-2.5
O	DATA TECHNOLOGY	3- 4	4	0	0.0
O	DATUM INC	1- 2	1 5/8	- 1/8	-7.1
O	DECISION DATA COMPUT	2- 3	2 1/4	- 1/4	-10.0
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
N	ELECTRONIC M & M	4- 5	3 3/4	- 1/4	-6.2
O	FABRI-TEK	1- 2	1	- 1/8	-14.9
O	GENERAL COMPUTER SYS	0- 2	1 1/4	0	0.0
N	HAZELTINE CORP	9- 12	10	- 1/8	-1.2
N	HARRIS CORP	28- 39	35 3/4	- 3/8	-1.0
A	INCOTERM CORP	10- 15	10 1/4	- 7/8	-7.8
O	INFOREX INC	4- 7	4 5/8	- 1/2	-9.7
O	INFORMATION INTL INC	9- 14	9 1/2	- 1/2	-5.0
O	INTEL CORP	38- 57	50 1/2	- 1/2	-0.9
A	LUNDY ELECTRONICS	3- 6	5 1/8	- 1/2	-8.8
O	MSI DATA CORP	6- 10	9 5/8	+ 1/8	+1.3
N	MOHAWK DATA SCI	5- 8	5 7/8	+ 1/8	+2.1
O	PENRIL CORP	2- 5	4 1/2	0	0.0
A	PERTEC CORP	7- 9	8	- 3/8	-4.4
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	2- 2	1 1/2	0	0.0
O	QUANTOR CORP	4- 5	4	0	0.0
O	RECOGNITION EQUIP	6- 10	8 1/2	- 3/8	-4.2
O	SCAN DATA	1- 2	1 3/8	- 1/8	-8.3
O	STORAGE TECHNOLOGY	10- 15	13 1/4	0	0.0
O	T BAR INC	7- 12	11 5/8	- 3/8	-3.1
O	TALLY CORP.	4- 6	3 5/8	- 1/8	-3.3
A	TEC INC	7- 10	8 1/8	- 1/8	-1.5
N	TEKTRONIX INC	29- 37	35	-1 1/2	-4.1
N	TELEX	2- 3	2 5/8	- 3/8	-12.5
O	WILTEK INC	1- 1	5/8	+ 1/8	+25.0

SUPPLIES & ACCESSORIES

EXCH		1977 RANGE (1)	CLOSE JUL 27 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	2- 4	1 7/8	+ 1/8	+7.1
A	BARRY WRIGHT	10- 14	13	-1 1/4	-8.7
O	CYBERMATICS INC	1- 1	3/4	+ 1/8	+20.0
O	DUPLEX PRODUCTS INC	14- 19	17 3/4	- 3/4	-4.0
N	ENNIS BUS. FORMS	6- 7	6 1/8	- 1/4	-3.9
O	GRAHAM MAGNETICS	11- 16	16	+1 3/4	+12.2
O	GRAPHIC CONTROLS	15- 18	17	0	0.0
N	3M COMPANY	48- 56	49 5/8	- 1/4	-0.5
C	MCORE CORP LTD	26- 37	26 1/4	-1 1/2	-5.4
N	NASHUA CORP	16- 25	21 3/4	-2 1/4	-9.3
O	STANDARD REGISTER	18- 25	22	-1	-4.3
O	TAB PRODUCTS CO	13- 19	17 3/4	- 3/4	-4.0
N	UARCO	19- 22	20 3/4	-1	-4.5
A	WABASH MAGNETICS	10- 15	12 5/8	-1 1/4	-9.0
N	WALLACE BUS FORMS	17- 21	19 1/8	- 3/8	-1.9

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